United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
The Pennsylvania State
University, College of
Agriculture;
Pennsylvania Department
of Environmental
Protection; and
Pennsylvania Department
of Agriculture

Soil Survey of York County, Pennsylvania

How to Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

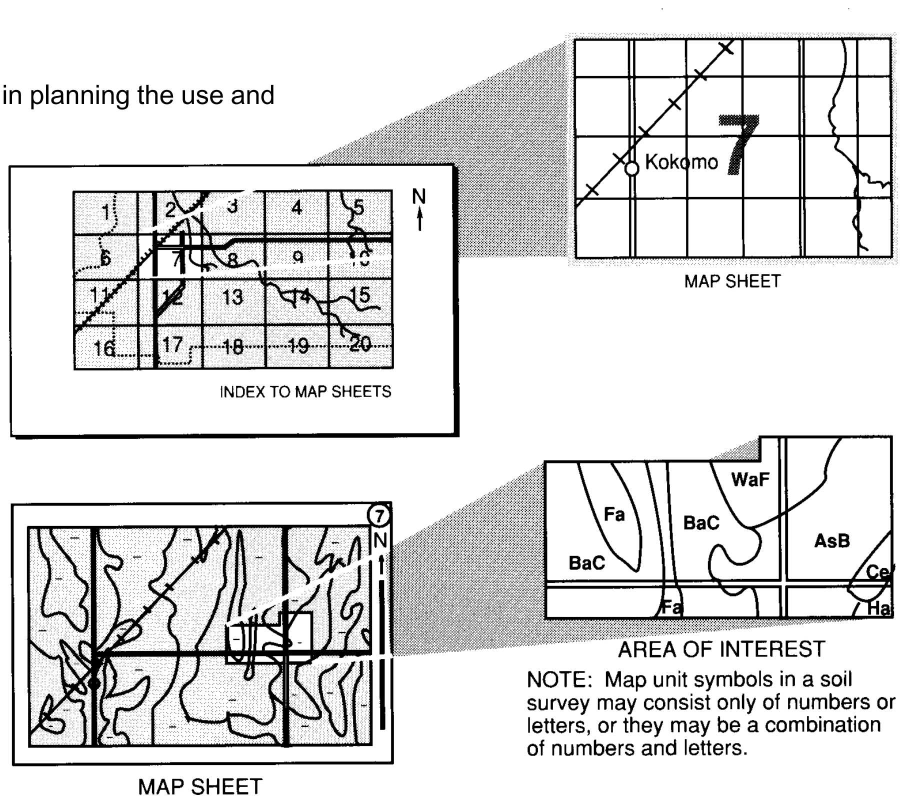
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service leads the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, religion, sex, age, or physical or mental disability.

Major fieldwork for this soil survey was completed in 1988. Soil names and descriptions were approved in 1990. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1988. This survey was made cooperatively by the Natural Resources Conservation Service; The Pennsylvania State University, College of Agriculture; the Pennsylvania Department of Environmental Protection; and the Pennsylvania Department of Agriculture. This survey is part of the technical assistance furnished to the York County Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

The first soil survey of York County, Pennsylvania, was published by the United States Department of Agriculture in 1914 (USDA 1914). When the county was surveyed again, the report was published by the United States Department of Agriculture in 1963 (USDA 1963). The current survey updates the latter survey. It provides additional information, updated soil delineations on orthophotographs, and more detailed map unit descriptions and interpretive information.

Cover: Contour stripcropping helps to reduce runoff and to control erosion. Chester soils are in the foreground. Mt. Airy and Manor soils are in the background.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov (click on "Technical Resources").

Contents

Issued 2003

Foreword

This soil survey contains information that can be used in land-planning programs in York County, Pennsylvania. It contains predictions of soil behavior for selected land uses. It also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited for use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Janet L. Oertly
State Conservationist
Natural Resources Conservation Service

Soil Survey of
York County, Pennsylvania

By Robert V. Smith, Natural Resources Conservation Service

Fieldwork by Robert V. Smith, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
The Pennsylvania State University, College of Agriculture; the Pennsylvania Department of Environmental Protection; and the Pennsylvania Department of Agriculture

York County is in the south-central part of Pennsylvania (fig. 1). The western shore of the Susquehanna River forms the eastern boundary, which joins Dauphin and Lancaster Counties. The Mason-Dixon line forms the southern boundary, which joins Harford, Baltimore, and Carroll Counties, Maryland. York County is bordered by Adams County, Pennsylvania, on the west and by Cumberland County, Pennsylvania, on the north. Yellow Breeches Creek forms most of the northern boundary.

York County takes in 583,053 acres, or about 911 square miles. The county lies mostly in the Piedmont province in Pennsylvania. It is dominantly undulating to rolling. It is commonly hilly, but has a few large, broad, flat valleys. It is highly dissected by many drainageways and streams. Conewago, Codorus, and Muddy Creeks are major streams and have many tributaries. Elevation in York County ranges from 100 feet at the Susquehanna River in the southeastern corner of the county to 1,412 feet on South Mountain, in the northern corner.

More than 100 different soils have been identified in York County. The soils have a wide range of texture, natural drainage, depth, slope, and other characteristics. In the southern half of the county, the soils are dominantly deep and well drained. On these soils slope is a major limitation to most uses. In the northern half of the county, the soils are more variable, and wetness, depth to bedrock, and slope are major limitations for most uses.

Cropland takes in about 42 percent of the land area in the county, woodland 26 percent, and pasture 14 percent. About 18 percent is in urban, industrial, commercial, and other uses.

General Nature of the County

This section provides general information about history and development, agriculture and industry, physiography, natural resources, and climate of York County.

History and Development

In 1681, the Duke of York, who later became King Charles II of England, granted to William Penn the royal charter for the province of “Penn’s Woods.” The province was first divided into Philadelphia, Bucks, and Chester Counties. In 1727, Lancaster County was formed from Chester County. At that time an unsettled area lay west of the Susquehanna River in what is now York County. In 1729, English settlers crossed the Susquehanna River, stopping along Kreutz Creek. At the same time German settlers were the first to stop at the present-day site of York. In 1741, Thomas Cookson laid out the central part of the city of York amid the 64,000-acre Springettesbury Manor.

In 1736, Lancaster County was extended to include a wide area west of the Susquehanna River. York County, named for the Duke of York, was separated from Lancaster County in 1749. At that time York County had a population of about 6,000. It included what is now Adams County until 1800. The northern boundary of York County was established when

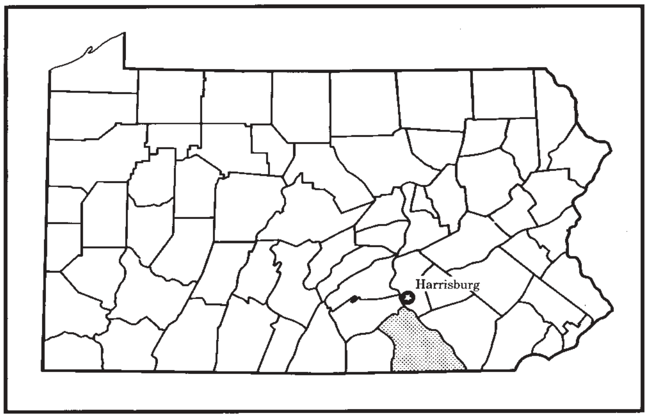


Figure 1.—Location of York County in Pennsylvania.

Cumberland County was separated from Lancaster County in 1750. The southern boundary of York County was established by the Mason-Dixon line, surveyed 1763-68.

Religious sects seeking religious freedom were the first settlers of York County. They included Mennonites, Moravians, Dunkards, Scotch-Irish Presbyterians, Quakers, and members of the Church of England. Generally, Germans settled the limestone valleys; Quakers, the northern part of the county; and Scotch-Irish and English, the southern part. The settlers cleared forestland to build farms, towns, and roads that reached all parts of the county.

During the British occupation of Philadelphia in 1777, the Continental Congress moved to York County. From September 30, 1777, to June 27, 1778, it held sessions in the courthouse in the public square in York.

At the close of the American Revolution, the population of the county in the present limits was about 17,000. York became a borough in 1787 and an incorporated city in 1887. The county had a population of 136,405 in 1910, 238,336 in 1960, and 312,963 in 1980. About 51 percent of the population is urban (COMM 1987). Urbanization of farmland is a trend in all parts of the county.

Agriculture and Industry

The early settlers practiced mainly subsistence farming in York County. Transportation of necessities from the East was slow, expensive, and irregular. The forests provided fuel, lumber, tannin, and charcoal. Limestone, clay, sand, iron, and stone were valuable raw materials. The soils and climate were suitable for corn, wheat, rye, buckwheat, and grasses. Livestock provided food, leather, and wool. The larger streams powered grist mills and sawmills and provided transportation.

The county has been primarily agricultural since earliest settlement. Most of the original German settlers were farmers, many of whom brought farm implements when they immigrated. Fields were cultivated continuously in one crop without use of manure or fertilizer. As productivity decreased old fields were abandoned and new fields were cleared and cultivated. In 1750, lime was used on farms, most of which had kilns for burning limestone. Lime was produced commercially beginning about 1840. Lime and fertilizer, along with crop rotations, were put into extensive use.

In 1910, the county was 92 percent farmland (USDA 1914) and the average farm was about 60 acres. Agriculture continues to be important in the county. In 1982 the county had about 2,300 farms and was about 51 percent farmland; the average farm was about 130 acres (USDC 1983). The main crops were corn, wheat, barley, soybeans, hay, potatoes, apples, peaches, and vegetables. In 1987, York County was first in Pennsylvania in the production of wheat, barley, and soybeans (PENN 1988). It was second in the number of farms and in the production of hogs and pigs. It was third in the production of peaches and corn for grain and seventh in total agricultural sales.

The early industries in the county were grist mills, sawmills, tanneries, ceramics, brick making, and ironworks. York became important and prosperous, attracting clockmakers, pewterers, gunsmiths, and other craftsmen and artisans.

The first iron furnaces were built in the early 1760’s to make cannons and cannonballs for use in the Revolutionary War. The furnaces flourished about 1800-60. Slate quarrying began near Delta in 1785. In 1785, skilled Welsh quarry workers enabled York to become a leading producer of quality roofing slate until the 1920’s. The first railroad steam engine was built in York by Phineas Davis. Following the Civil War, growing tobacco and making cigars became important. In 1920, York produced 20 percent of the Nation’s cigars.

The metal and machine industries have been important since the Civil War. Today, manufacturing is the largest industry in York County. In 1982, 629 manufacturing establishments had total sales of more than $4 billion (COMM 1987). Important products are tanks and tank components, construction machinery, refrigeration and heating equipment, electrical wiring devices, electronic connectors, motorcycles, bicycles, paper, ammunition, pottery products, clothing, fabricated metals, dental equipment and supplies, turbines, and metal office furniture.

Physiography

York County lies in the Valley and Ridge, Blue Ridge, and Piedmont physiographic provinces. About 1 percent of the county is in the Great Valley section of the Valley and Ridge province. This part lies in an undulating valley adjacent to Yellow Breeches Creek along the northeastern boundary of the county. It is underlain by dominantly limestone bedrock. It comprises the Urban land-Duffield-Hagerstown general soil map unit.

About 1 percent, in the northwestern corner of the county, is in the South Mountain section of the Blue Ridge province. This part consists of a broad ridge that crests about 600 feet above the surrounding area. The ridge peaks at an elevation of 1,412 feet. Dogwood Run is the major drainageway. South Mountain is underlain by hard, resistant quartzite and, along the western flank, metabasalt. The Edgemont general soil map unit is in this part of the county.

The Piedmont province comprises the Conestoga Valley, Piedmont Uplands, and Triassic Lowland sections (fig. 2). The Conestoga Valley section makes up about 6 percent of the county. It is irregular in shape, undulating, and 1 to 4 miles wide. It extends southwest from Wrightsville on the Susquehanna River, through the city of York to Hanover. The major streams are Codorus, Kreutz, and Oil Creeks. The Conestoga Valley is underlain by limestone, dolomite, and calcareous schist bedrock. It comprises the Urban land-Duffield-Hagerstown and Conestoga-Urban land-Clarksburg general soil map units.

The Piedmont Uplands section makes up about 60 percent of the county. It occupies all the area south of the Conestoga Valley section. It includes the Pigeon Hills and surrounding uplands north of Hanover and Spring Grove. It also includes the Hellam Hills that extend northward from York, Hellam, and Wrightsville to Starview. The Piedmont Uplands section is rolling and hilly and has both broad and narrow ridgetops at elevations of 700 to 1,000 feet. It is highly dissected, and many drainageways are deep and have steep sides. The major streams are the East, South, and West Branches of Codorus Creek, Muddy Creek, South Branch Conewago Creek, Deer Creek, Otter Creek, and their many tributaries. The Piedmont Uplands are underlain by dominantly schist, phyllite, and quartzite bedrock. The Chester-Glenelg, Mt. Airy-Glenelg-Manor, and Mt. Airy-Manor general soil map units are in the Piedmont Uplands. The Edgemont general soil map unit is in parts of the Pigeon Hills and Hellam Hills.

The Triassic Lowland section of the Piedmont province makes up the remaining 32 percent of the county. The major streams are Conewago, Little Conewago, Yellow Breeches Creeks, and their tributaries. This section consists of low uplands that have high ridges, knobs, and hills. The low uplands are undulating to rolling and reach an elevation of 400 to 600 feet. They are underlain by red shale, sandstone, and conglomerate bedrock that in the southern part is interbedded with gray sandstone. The Penn-Lansdale-Readington, Penn-Klinesville-Readington, and Lewisberry-Steinsburg general soil map units are in the low uplands. The Conewago Mountains extend across the central part of the county

Figure 2.—The Triassic Lowlands. South Mountain is in the background.

south of Conewago Creek. They have an elevation of 900 to 1,000 feet. They are underlain by resistant red sandstone and conglomerate bedrock. The Penn general soil map unit is in this area. In the northern part of the county there are many hills and ridges that are underlain by diabase and metamorphosed shale and sandstone bedrock. Nells hill reaches 1,330 feet in elevation; Round Top, 1,355 feet. The Neshaminy-Lehigh general soil map unit is in this area.

Mineral Resources

Mineral resources that have influenced development in York County include limestone, slate, iron, clay, sand, and stone.

York County is one of the major limestone producing counties in Pennsylvania. It has adequate limestone deposits, good transportation facilities, and a large local demand. At first, limestone was used as building stone or burned for agricultural lime. It was also used as flux for many local iron furnaces. Small, abandoned quarries and old kilns are scattered throughout the limestone areas. At present, several large limestone quarries are operational in York County. Most of the limestone is now extracted by mining beneath the earth's surface. The limestone is crushed for use in building roads or in making concrete and bituminous paving mixtures. Or, it is pulverized for use in agriculture or in making portland and natural cement, dolomite brick fillers, glass, and porcelain. It is also burned for lime.

The slate industry was established in the Peach Bottom area near Delta, close to the southern border. Slate was first quarried in 1749, but in 1847, Welsh quarrying methods stimulated industry growth (STOSS 1932). Thus, York County became a major producer of high grade roofing slate. Recently, slate has been crushed for roofing granules.

Iron has been mined extensively to supply the local iron industry, particularly between 1860-80. Much of the limonite, magnetite, and hematite iron ore was mined near Dillsburg and in the Hellam hills (STOSS 1932). At present, these minerals do not have commercial value.

Clay is used to make bricks and pottery. White paper clay was mined in the South Mountain area for use as filler in paper and paint. At present, weathered red shale is stripped and used in manufacturing bricks.

Sand has been extracted largely from disintegrated quartzite and sandy limestone and from crushed beds of harder quartzite. It is used both in building and in manufacturing bricks.

Stone has been quarried since the early development of the county for use in constructing buildings, roads, retaining walls, bridge piers, and dams. The kinds of stone used most often were quartzite, limestone, brownstone (red sandstone), schist, and ironstone (diabase).

In 1982, total sales of the mineral industry in York County was $15,100,000 (COMM 1987).

Climate

This section was prepared by the National Climatic Center, Asheville, North Carolina

York County is rather cold in winter and hot in summer. Winter precipitation frequently occurs as snow, results in a good accumulation of soil moisture by spring, and minimizes drought in summer on most soils. Normal annual precipitation is adequate for all crops adapted to the temperature and length of growing season in the area.

Table 1 gives data on temperature and precipitation for the survey area as recorded at York, Pennsylvania, in the period 1961-90. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season. The information below on thunderstorms, relative humidity, and windspeed was recorded at Harrisburg, Pennsylvania, during the period 1951-88.

In winter the average temperature is 31.6 degrees F, and the average daily minimum temperature is 22.0 degrees. The lowest temperature on record, which occurred at York, Pennsylvania, on January 21, 1994, is -21 degrees. In summer the average temperature is 72.6 degrees, and the average daily maximum temperature is 85.1 degrees. The highest recorded temperature, which occurred at York, Pennsylvania, on July 10, 1936, is 105 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 40 inches. Of this, 21 inches, or 53 percent, usually falls in May through October. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in May through October is less than 11 inches. The heaviest 1-day rainfall during the period of record was 13.5 inches at York on June 22, 1972. Thunderstorms occur on about 32 days each year, and most occur in summer.

The average seasonal snowfall is 31.6 inches. The greatest snow depth at any one time during the period of record was 33 inches. On average, 28 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 53 percent. Humidity is higher at night, and the average at dawn is about 76 percent. The sun shines 67 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the west-northwest. Average windspeed is highest, 9 miles per hour, in spring.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, soil reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map

unit. Aerial photographs show trees, buildings, fields, roads and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soil of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are named and mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the map unit descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows the general soil map units in this survey area. Each unit has a distinctive pattern of soils, relief, and drainage. Each unit on the general soil map is a unique natural landscape. Typically, a unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm of field or of selecting a site for a road or building or other structure. The soils in any one unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The name, descriptions and delineations of soils on the general soil map of York County do not always agree or join fully with those of the soils identified on the maps of adjoining counties published at an earlier date. Some differences are the result of changes in concepts of soil series. Other differences result from variations in the extent of soils. Other differences are the result of variations in the slope range allowed in the associations of adjoining counties.

Soil Descriptions

Well Drained and Somewhat Excessively Drained Soils that are Dominantly Undulating and Rolling

The four map units in this group make up about 52 percent of York County. The Lewisberry-Steinsburg map unit is in the northern part of the county, but the other map units are in the southern two-thirds. The soils in this group are on undulating and rolling uplands that have some steeper ridge slopes, a few hills, and associated lowlands and drainageways. Most of the soils are very deep to moderately deep and somewhat excessively drained and well drained.

The main uses of the soils in this group are cropland, orchards, and pasture. Also included in the map units of this group are parts of the city of York and surrounding residential, commercial, and industrial developments. Many towns, residential developments, and a few areas of woodland and idle land are scattered throughout these map units.

Most of the soils in this group are well suited to cropland, orchards, pasture, and woodland. Erosion is a hazard. Slope, depth to bedrock, and permeability are serious limitations to use of these soils for most onsite waste disposal systems and most urban uses.

1. Urban land-Duffield-Hagerstown

Urban land and nearly level to strongly sloping, very deep, well drained soils formed dominantly in residuum derived from limestone; on ridges and in narrow valleys

These soils are on ridges that have nearly level, undulating to strongly sloping side slopes. They are also in narrow valleys.

This map unit makes up about 3 percent of the county. It is about 45 percent Urban land, 25 percent Duffield soils, 10 percent Hagerstown soils, and 20 percent soils of minor extent.

Urban land is areas either occupied by buildings and structures or covered by asphalt, concrete, and other impervious surfaces. It is dominantly nearly level and gently sloping.

Duffield soils are nearly level to strongly sloping. They are on lower ridges, in narrow, undulating valleys, and on valley sides. These soils overlie limestone bedrock at a depth of more than 60 inches. They are very deep and well drained.

Hagerstown soils are nearly level and gently sloping. They are on ridges and narrow side slopes. They overlie limestone bedrock at a depth of more than 60 inches. They are very deep and well drained.

Of minor extent in this map unit are Mt. Airy, Chester, Conestoga, Birdsboro, Elk, Clarksburg, Penlaw, Chagrin, and Lindside soils. The somewhat excessively drained Mt. Airy soils are on sides of hills. The well drained Chester and Conestoga soils are on higher ridges and hills. The well drained Birdsboro and

Elk soils are on stream terraces. The moderately well drained Clarksburg soils are on ridgetops. The somewhat poorly drained Penlaw soils are on broad ridgetops and in depressions on lowlands. The well drained Chagrin and moderately well drained Lindside soils are on bottom lands. Some active or abandoned quarries are scattered throughout the map unit (fig. 3).

Urban land covers most areas of the map unit. In some areas the soils in this map unit are used for corn, soybeans, and winter wheat. A few, small acreages are woodland. Duffield soils are fairly well suited to sites for dwellings or recreation areas. Slope on Hagerstown soils and restricted permeability on Duffield soils are limitations for sanitary facilities.

2. Chester-Glenelg

Gently sloping to moderately steep, deep and very deep, well drained soils formed dominantly in residuum derived from schist, phyllite, and saprolite; on broad ridgetops and hills

These soils are on tops of broad, dissected ridgetops and side slopes. They are dominantly undulating to rolling, but in some areas they are hilly and steep (fig. 4).

This map unit makes up about 29 percent of the county. It is about 50 percent Chester soils, 20 percent Glenelg soils, and 30 percent soils of minor extent.

Chester soils are gently sloping and strongly sloping. They are on tops of higher ridges, on narrow benches that have nearly level and gentle slopes, and on side slopes. They overlie schist and phyllite bedrock at a depth greater than 60 inches. They are very deep and well drained.

Glenelg soils are gently sloping to moderately steep. They are on narrow ridges and on sides of steep hills. These soils overlie schist and saprolite bedrock at a depth of 50 inches. They are deep and well drained.

Of minor extent in this map unit are Mt. Airy, Manor, Glenville, Baile, and Codorus soils. The somewhat excessively drained Mt. Airy and Manor soils are on highly dissected ridges and hills. The moderately well drained Glenville and the poorly drained Baile soils are on lowlands. The moderately well drained Codorus soils are on bottom lands. A few, small areas of Urban land are scattered throughout.

In most areas the soils in this map unit are used as cropland, hay, and pasture. In some areas they are used for urban development. A few areas are woodland. The major crops are corn, soybeans, small grain, vegetables including potatoes, apples, and peaches. Erosion is a hazard if cultivated crops are grown.

These soils are well suited to poorly suited to cultivated crops and specialty crops. They are well suited to hay, pasture, and woodland. Many dairy farms in the county are on these soils. These soils are fairly well suited to most urban uses. Restricted permeability and slope are the major limitations. Where slopes are not too steep, these soils are suitable for recreation development.

3. Mt. Airy-Glenelg-Manor

Gently sloping to moderately steep, moderately deep to very deep, somewhat excessively drained and well

Figure 3.—Conestoga Valley as seen from the Piedmont Uplands. The limestone quarry, which is active, is in the Urban land-Duffield-Hagerstown general soil map unit.

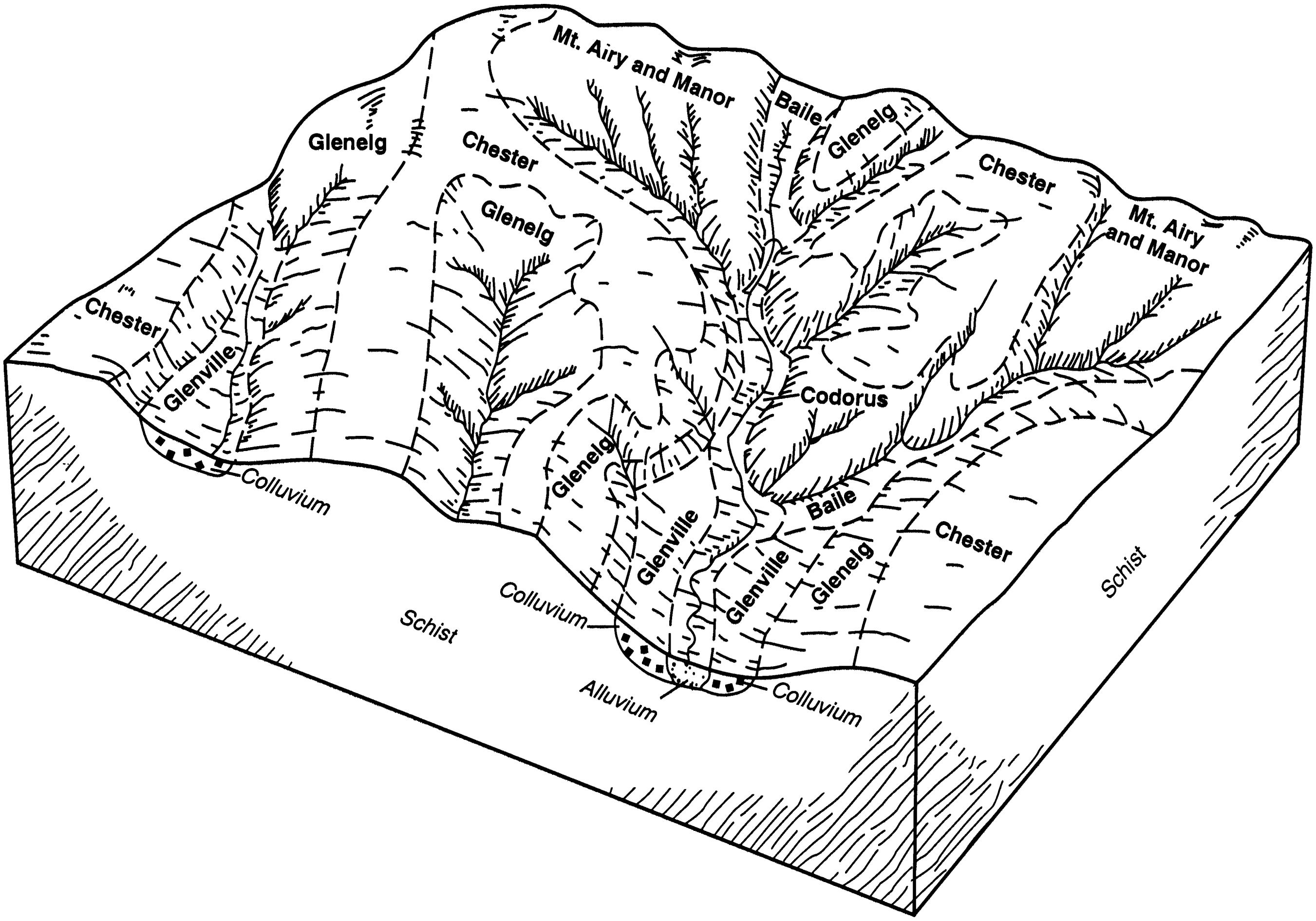


Figure 4.—Typical pattern of soils and parent material in the Chester-Glenelg general soil map unit.

drained soils formed dominantly in residuum derived from schist and phyllite; on ridges and hills

These soils are on highly dissected ridgetops and side slopes. Areas are undulating to rolling, but some areas are hilly and steep (fig. 5).

This map unit makes up about 19 percent of the county. It is about 45 percent Mt. Airy soils, 20 percent Glenelg soils, 15 percent Manor soils, and 20 percent minor soils.

Mt. Airy soils are gently sloping to moderately steep and are on ridges, hills, and steep side slopes. These soils are channery throughout. They overlie schist and phyllite bedrock at a depth of 32 inches. They are moderately deep and somewhat excessively drained.

Glenelg soils are gently sloping to moderately steep and are on narrow ridgetops and on side slopes. These soils overlie schist and saprolite bedrock at a depth of 50 inches. They are deep and well drained.

Manor soils are gently sloping to moderately steep. They are on ridges, hills, and steep side slopes. These soils are channery. They overlie schist and phyllite bedrock at a depth greater than 60 inches. They are very deep and somewhat excessively drained.

Of minor extent in this map unit are Chester, Glenville, Baile, Chagrin, Codorus, and Hatboro soils. The well drained Chester soils are on broad ridgetops. The moderately well drained Glenville soils and the poorly drained Baile soils are on lowlands. The well drained Chagrin soils, the moderately well drained Codorus soils, and the poorly drained Hatboro soils are on bottom lands. A few, small areas of Urban land are scattered throughout. Some recreation areas, such as Lake Marburg (fig. 6), Lake Redman, Lake Williams, and Long Arm Reservoir are included in this map unit.

In most areas the soils in this map unit are used for cropland, hay, and pasture. In some areas they are used for urban or recreation development. A few areas are woodland. The major crops are corn, soybeans, small grain, vegetables including potatoes, apples, and peaches. Slope is the major limitation. Erosion is the major hazard.

Figure 5.—Typical pattern of soils in the Mt. Airy-Glenelg-Manor general soil map unit.

These soils are well suited to generally unsuited to cultivated crops and specialty crops. They are fairly well suited to improved pasture. On the steeper slopes, erosion is a severe hazard and hay crops are impractical. These soils are suitable for woodland. On the steeper slopes, use of logging roads and skid trails is restricted. Slope is a severe limitation and the unit generally is unsuited to urban use. Slope is a difficult limitation to overcome. Suitability is poor for recreation development because of slope.

4. Lewisberry-Steinsburg

Gently sloping to moderately steep, very deep to moderately deep, well drained soils formed dominantly in residuum derived from sandstone and conglomerate; on dissected ridges and low hills

These soils are on undulating and rolling ridges and hills and on some steeper ridge slopes and hills in the northern part of the county.

This map unit makes up about 1 percent of the county. It is about 55 percent Lewisberry soils, 25 percent Steinsburg soils, and 20 percent minor soils.

Lewisberry soils are gently sloping and strongly sloping and are on ridgetops and side slopes. They are sandy. They overlie red sandstone and conglomerate at a depth of 62 inches. They are very deep and well drained.

Steinsburg soils are strongly sloping and moderately steep. They are on ridges and hills. They overlie red sandstone and conglomerate at a depth of 26 inches. They are moderately deep and well drained.

The soils of minor extent are Klinesville, Lansdale, Penn, Readington, Croton, Rowland, and Bowmansville soils. The somewhat excessively drained, shallow Klinesville soils are on side slopes below Lewisberry and Steinsburg soils. The well drained Lansdale and Penn soils are on lower ridges and hills. The moderately well drained Readington soils are in depressions and along drainageways on lowlands. The poorly drained Croton soils are in depressions and in drainageways on lowlands. The moderately well drained Rowland soils and the somewhat poorly drained Bowmansville soils are on bottom lands.

In most areas the soils in this map unit are used as cropland and woodland. Corn, soybeans, small grain, hay, and pasture are the major crops. A few areas are used for urban development. Small towns are scattered throughout.

On slopes of less than 15 percent, these soils are well suited or fairly well suited to cropland. On slopes of less than 25 percent, they are well suited to pasture. On cropland and pasture the hazard of erosion is a major management concern. Potential for trees on these soils is moderately high. Erosion hazard, the equipment limitation, seedling mortality, and plant competition are major woodland management concerns.

These soils are fairly well suited to sites for dwellings. Slope and depth to bedrock are major limitations. Slope needs to be modified on sites for urban development. Lewisberry soils are fairly well suited to sanitary facilities. On Steinsburg soils slope and depth to bedrock restrict use for sanitary facilities; suitability is fair for recreation development.

Well Drained Soils that are Dominantly Hilly and Steep

Three map units in the group make up about 15 percent of York County. They are in the southeastern part of the survey area near the Susquehanna River and Muddy Creek and on South Mountain, Pigeon Hills, Hellam Hills, and Conewago Mountains. They are on hills and ridges that have narrow tops and moderately steep to very steep side slopes. The soils are very deep to moderately deep, well drained, and in most areas very stony.

The soils in this group are used mainly as woodland or recreation areas. On some ridgetops and foot slopes they are farmed. Urban developments are scattered along major roads. A few campgrounds are on these soils.

Most soils in this group are well suited to woodland. The soils are poorly suited to cropland and pasture because of slope, the low available water capacity, and the hazard of erosion. These soils have serious limitations for most onsite waste disposal systems and most urban uses because of slope, depth to bedrock, and permeability.

5. Mt. Airy-Manor

Gently sloping to very steep, moderately deep and very deep, somewhat excessively drained soils formed dominantly in residuum derived from schist and phyllite; on dissected ridges and hills

These soils are on dissected hills and ridges along the Susquehanna River and Muddy Creek. They are dominantly hilly, steep, and very steep and have narrow, undulating to rolling ridgetops and deep, V-shaped valleys and drainageways.

This map unit makes up about 10 percent of the county. It is about 50 percent Mt. Airy soils, 20 percent Manor soils, and 30 percent minor soils (fig. 7).

Mt. Airy soils are gently sloping to very steep. They are on ridges and hills. They are channery throughout and have schist and phyllite bedrock at a depth of 32 inches. They are moderately deep and somewhat excessively drained.

Manor soils are gently sloping to very steep. They are on ridges and hills. They overlie schist and phyllite bedrock at a depth greater than 60 inches. They are very deep and somewhat excessively drained.

Of minor extent in this map unit are Chester, Glenelg, Glenville, and Codorus soils. The well drained Chester and Glenelg soils are on narrow ridgetops. The moderately well drained Glenville soils are in depressions and drainageways. The moderately well drained Codorus soils are on narrow bottom lands.

In most areas the soils in this map unit are used for woodland. In a few areas on some of the broader ridgetops they are used for cropland and orchards. In many areas they are used for hunting, camping, and other forms of recreation. The major crops are pulpwood, timber, corn, soybeans, small grain, hay,

Figure 6.—Lake Marburg and Codorus State Park are in the Mt. Airy-Glenelg-Manor general soil map unit.

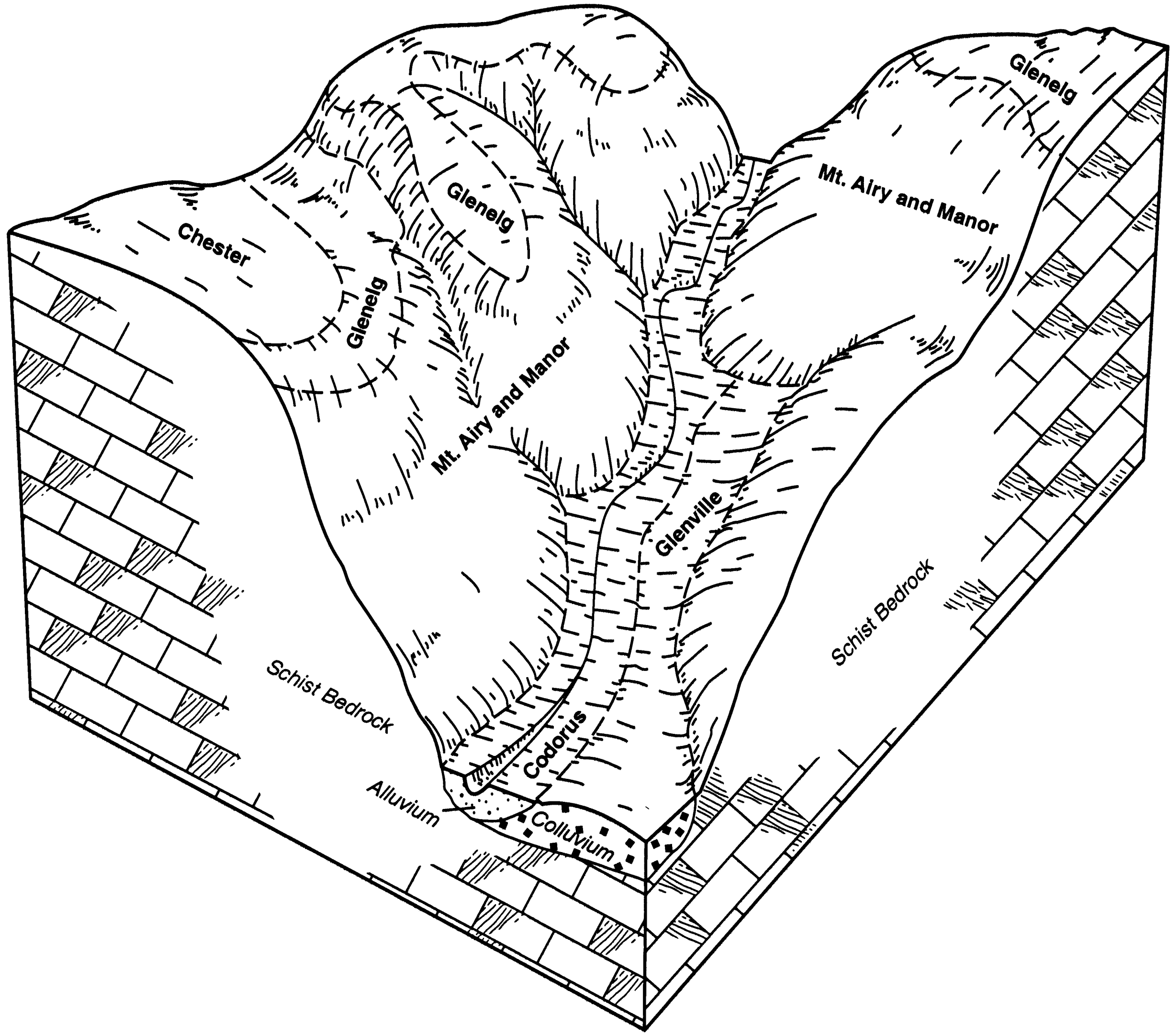


Figure 7.—Typical pattern of soils and parent material in the Mt. Airy-Manor general soil map unit.

and pasture. Erosion is the main hazard where cultivated crops are grown.

These soils are generally too steep or too stony to be used for cultivated crops. They are well suited to use as woodland, recreation areas, and wildlife habitat. They generally are unsuited to most onsite waste disposal systems and urban uses because of depth to bedrock, slope, and permeability.

6. Edgemont

Gently sloping to very steep, very deep, well drained soils formed dominantly in residuum derived from quartzite and conglomerate; on ridges and hills

These soils are on the South Mountain in the northwestern corner of the county. They are also on Pigeon Hills north of Hanover and on Hellam Hills north of Wrightsville and Hellam. They are dominantly hilly and have narrow, undulating and rolling ridgetops.

This map unit makes up about 3 percent of the county. It is about 75 percent Edgemont soils and 25 percent soils of minor extent.

Edgemont soils are channery and generally very stony. They overlie quartzite and conglomerate at depths greater than 60 inches.

Of minor extent in this map unit are Catoctin, Mt. Airy, Chester, Glenelg, Highfield, and Glenville soils. The somewhat excessively drained Catoctin and Mt. Airy soils are on sides of ridges and hills below Edgemont soils. The well drained Chester, Glenelg, and Highfield soils are on broader ridgetops. The moderately well drained Glenville soils are in depressions and drainageways.

In most areas these soils are woodland. In a few

areas on some broader ridgetops and foot slopes they are used for cropland. Rocky Ridge County Park, Camp Tuckahoe, and several residential developments are on these soils. Urban developments are scattered along the major roads. The major cash crops are timber, corn, soybeans, small grain, hay, and pasture.

These soils are well suited to generally unsuited to cultivated crops and specialty crops. They are fairly well suited to improved pasture. Erosion is a severe hazard on the steeper slopes, and hay crops are impractical. These soils are suited to use as woodland and wildlife habitat. On the steeper slopes, however, use of logging roads and skid trails is restricted. Slope is a severe limitation for urban uses. It is a difficult limitation to overcome. Suitability is poor for recreation development because of slope.

7. Penn

Gently sloping to very steep, moderately deep, well drained soils formed dominantly in residuum derived from sandstone, conglomerate, and siltstone; on ridges and hills

These soils are dominantly rolling and hilly. They are also on narrow, undulating ridgetops of Conewago Mountain in the northern part of the county.

This map unit makes up about 2 percent of the county. It is about 90 percent Penn soils and 10 percent soils of minor extent.

Penn soils are dominantly very stony and overlie red sandstone and conglomerate at a depth of 38 inches.

Of minor extent in this map unit are Klinesville, Readington, and Croton soils. The somewhat excessively drained Klinesville soils are on sides of hills below Penn soils. The moderately well drained Readington soils and the poorly drained Croton soils are in depressions and drainageways.

In most areas the soils in this map unit are woodland. In some areas on some foot slopes, they are used for cropland and orchards. A few urban developments and towns are scattered along major roads or are on ridgetops and foot slopes.

These soils are well suited to generally unsuited to cultivated crops and specialty crops. They are fairly well suited to improved pasture. On the steeper slopes erosion is a severe hazard and hay crops are impractical. These soils are suited to use as woodland and wildlife habitat. On the steeper slopes, however, use of logging roads and skid trails is restricted. Generally, slope is a severe limitation to urban uses. It is a difficult limitation to overcome. Suitability is poor for recreation development because of slope.

Somewhat Excessively Drained to Moderately Well Drained Soils that are Dominantly Nearly Level to Rolling

The four map units in this group make about 33 percent of York County. They are scattered throughout all but the southern part of the survey area. This group is on nearly level to rolling uplands, in drainageways, and on some ridges, hills, lowlands, and flood plains. The soils are very deep to shallow and somewhat excessively drained to moderately well drained.

The soils in this group are used mainly for cropland, orchards, pasture, and woodland. York and Hanover are the largest population centers, but smaller towns are scattered throughout the soils in this group. Many residential, commercial, and industrial developments are located on these soils.

In most areas the soils in this group are well suited to cropland, orchards, pasture, and woodland. Erosion is a hazard in cultivated areas. Slope, depth to bedrock, and permeability are serious limitations for most onsite waste disposal systems and most urban uses.

8. Conestoga-Urban land-Clarksburg

Urban land and nearly level to strongly sloping, very deep, well drained and moderately well drained soils formed in residuum derived from limestone and calcareous schist; on nearly level to rolling uplands

These soils are on nearly level to rolling uplands, on lowlands, and in drainageways. In an area in the valley they extend from the Susquehanna River at Wrightsville to west of the city of York. They are also in an area in Hanover and in a small area near East Prospect.

This map unit makes up about 4 percent of the county. It is about 40 percent Conestoga soils, 25 percent Urban land, 10 percent Clarksburg soils, and 25 percent soils of minor extent.

Conestoga soils are nearly level to strongly sloping. They are on smooth and undulating uplands. They overlie limestone and calcareous schist bedrock to a depth greater than 60 inches. They are very deep and well drained.

Urban land is occupied by buildings and structures or is covered by asphalt, concrete, and other impervious surfaces. It is dominantly nearly level and gently sloping.

Clarksburg soils are nearly level and gently sloping. They are on lowlands and in depressions. These soils overlie limestone bedrock at a depth greater than 60 inches. They are very deep and moderately well drained. In most areas they have a seasonal high water table during the wet season.

Of minor extent in this map unit are Mt. Airy, Chester, Duffield, Glenelg, Hagerstown, Pequea, Elk, Penlaw, Chagrin, and Lindside soils. The somewhat excessively drained Mt. Airy soils are on sides of mountains. The well drained Chester, Duffield, Glenelg, Hagerstown and Pequea soils are on ridges and hills similar to those of Conestoga soils. The well drained Elk soils are on stream terraces. The somewhat poorly drained Penlaw soils are on broad uplands and in depressions on lowlands. The well drained Chagrin soils and the moderately well drained Lindside soils are on bottom lands. Some active or abandoned quarries are scattered throughout the map unit.

A large part of the map unit is in urban development. Of the rest, most areas are used as cropland or recreation areas. The major cash crops are corn, soybeans, small grain, hay, and pasture. A few, small acreages are woodland. Conestoga soils, however, are only fairly well suited to sanitary facilities because of slope and moderate permeability. On Clarksburg soils wetness and restricted permeability are limitations for sanitary facilities. In the more gently sloping areas, however, Conestoga soils are well suited to sites for dwellings. On Conestoga and Clarksburg soils, suitability is good for recreation development.

9. Penn-Lansdale-Readington

Nearly level to strongly sloping, moderately deep and deep, well drained and moderately well drained soils formed in residuum derived from shale, siltstone, sandstone, and conglomerate; on undulating to rolling uplands

These soils are on dissected uplands in the central part of the county. This is a dominantly undulating to rolling area that has depressions, drainageways, and some moderately steep to very steep side slopes.

This map unit makes up about 5 percent of the county. It is about 40 percent Penn soils, 30 percent Lansdale soils, 10 percent Readington soils, and 20 percent soils of minor extent.

Penn soils are gently sloping and strongly sloping. They are on broad to narrow ridgetops and on sides of ridges. These soils overlie red shale, siltstone, and sandstone at a depth of 38 inches. They are moderately deep and well drained.

Lansdale soils are gently sloping and strongly sloping. They are on broad to narrow ridgetops and on sides of ridges. These soils overlie brown and gray sandstone and conglomerate at a depth of 47 inches. They are deep and well drained.

Readington soils are nearly level and gently sloping. They are on broad ridgetops, in depressions, and along drainageways. These soils overlie dominantly red shale, siltstone, and sandstone at a depth of 46 inches. They are deep and moderately well drained. They have a seasonal high water table during wet periods.

Of minor extent in this map unit are Klinesville, Steinsburg, Croton, Bermudian, Rowland, and Bowmansville soils. The somewhat excessively drained Klinesville soils and the well drained Steinsburg soils are on highly dissected ridges and hills. The poorly drained Croton soils are on depressions and in drainageways on lowlands. The well drained Bermudian soils, the moderately well drained Rowland soils, and the somewhat poorly drained Bowmansville soils are on bottom lands. A few, small areas of Urban land are scattered throughout the map unit.

In most areas the soils in this map unit are used for cropland, hay, and pasture. In some areas they are used for urban development. A few areas are woodland. The major crops are corn, soybeans, small grain, hay, and pasture. Erosion is a hazard if cultivated crops are grown.

These soils are well suited to poorly suited to cultivated crops and specialty crops. They are well suited to hay, pasture, and woodland. Many dairy farms in the county are on these soils. These soils are poorly suited to sanitary facilities. Penn soils, however, are fairly well suited to sites for dwellings. Lansdale soils are well suited to dwellings. On Readington soils, wetness is a limitation for dwellings. On Penn, Lansdale, and Readington soils, suitability is good for recreation development.

10. Penn-Klinesville-Readington

Nearly level to strongly sloping, deep to shallow, somewhat excessively drained to moderately well drained soils formed in residuum derived from shale, siltstone, and fine-grained sandstone; on undulating to rolling hills and ridges

These soils are on highly dissected uplands and associated drainageways. They are dominantly undulating to rolling but also are on some short, steep ridges, hills, and nearly level to gently rolling lowlands (fig. 8).

This map unit makes up about 14 percent of the county. It is about 40 percent Penn soils, 30 percent Klinesville soils, 15 percent Readington soils, and 15 percent soils of minor extent.

Penn soils are gently sloping and strongly sloping. They are on broad to narrow ridgetops and on sides of ridges. These soils overlie red shale, siltstone, and fine-

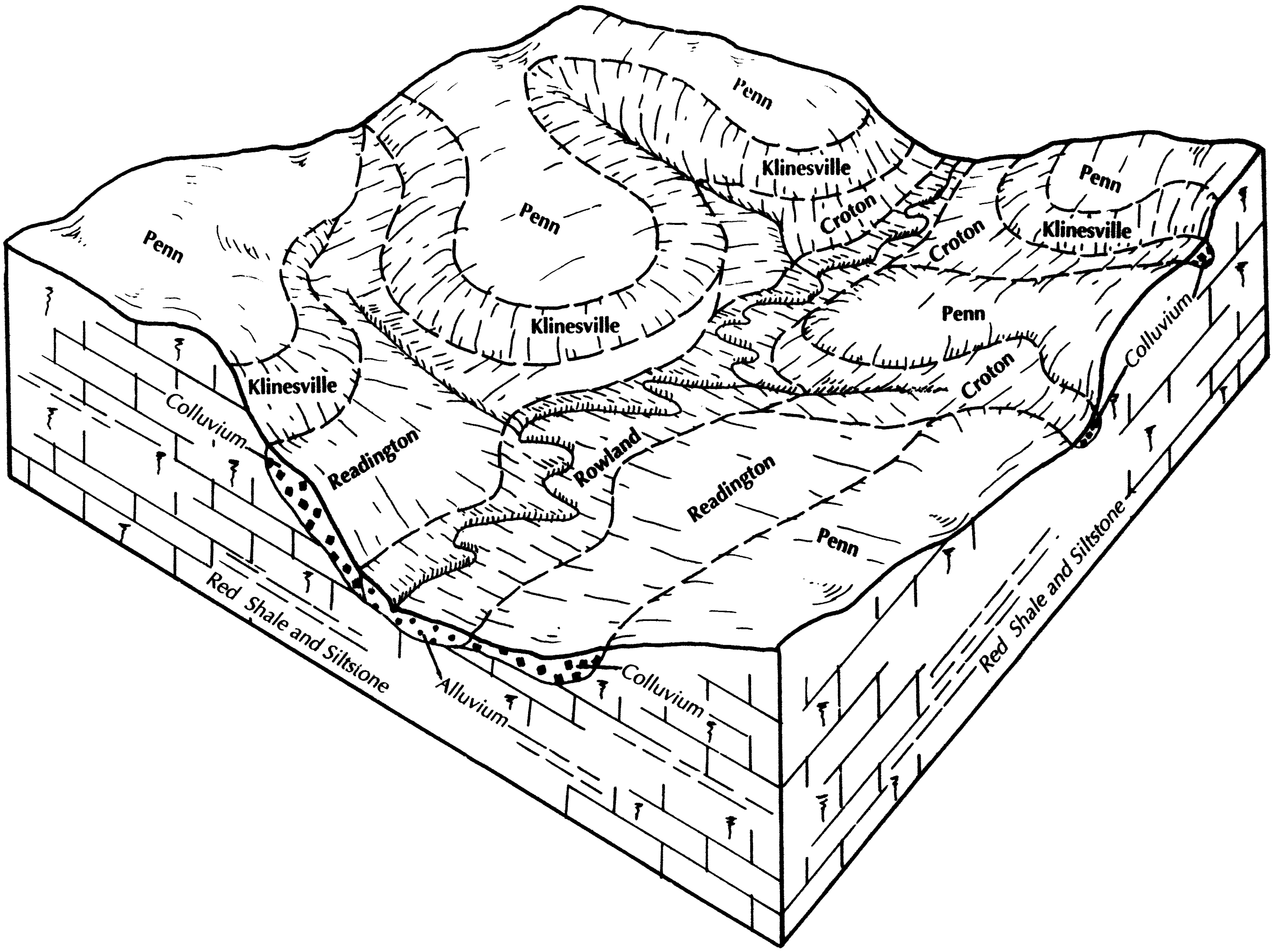


Figure 8.—Typical pattern of soils and parent material in the Penn-Klinesville-Readington general soil map unit.

grained sandstone at a depth of 38 inches. They are moderately deep and well drained.

Klinesville soils are gently sloping and strongly sloping. They are on ridges and hills. They overlie red shale, siltstone, and fine-grained sandstone at a depth of 16 inches. They are shallow and somewhat excessively drained.

Readington soils are nearly level and gently sloping. They are on broad ridgetops, in depressions, and along drainageways. These soils overlie dominantly red shale, siltstone, and sandstone at a depth of 46 inches. They are deep and moderately well drained. These soils have a seasonal high water table during wet periods.

Of minor extent in this map unit are Croton and Rowland soils. The poorly drained Croton soils are in depressions and drainageways on lowlands. The moderately well drained Rowland soils are on bottom lands. A few, small areas of Urban land are scattered throughout the map unit.

In most areas the soils in this map unit are used for cropland and woodland. In some areas they are used for urban development. A few areas are idle land. The major crops are corn, soybeans, small grain, hay, and pasture. Erosion is a hazard if cultivated crops are grown.

These soils are well suited to poorly suited to cultivated crops and specialty crops. They are well suited to hay, pasture, and woodland use. Many dairy farms are on these soils. In most areas these soils are poorly suited to sanitary facilities. The Penn soils, however, are fairly well suited to most urban uses. Klinesville soils are poorly suited to urban uses because of slope. On Readington soils, wetness is a limitation for most urban uses. On Penn, Klinesville, and Readington soils,

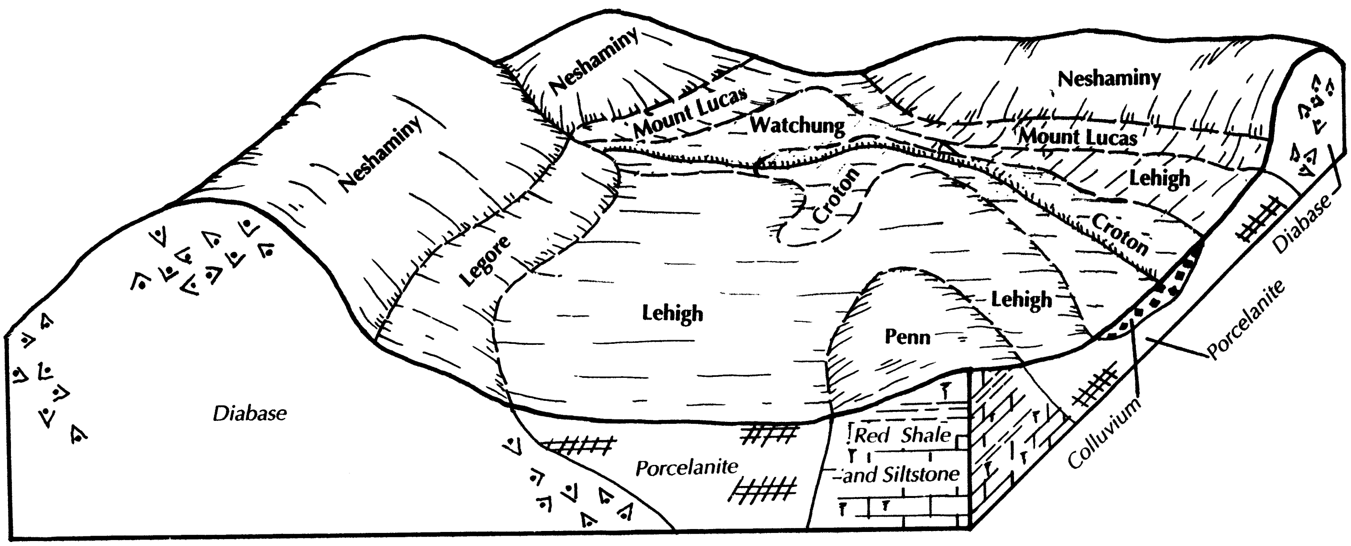


Figure 9.—Typical pattern of soils and parent material in the Neshaminy-Lehigh general soil map unit.

suitability is good for some types of recreation development.

11. Neshaminy-Lehigh

Nearly level to very steep, deep and very deep, well drained to somewhat poorly drained soils formed in residuum derived from diabase and porcelanite; on ridges, rounded hills, and adjacent lowlands

These soils are dominantly smooth to rolling. In some areas in the northern part of the county, they are hilly (fig. 9).

This map unit makes up about 10 percent of the county. It is about 48 percent Neshaminy and similar soils, 32 percent Lehigh and similar soils, and 20 percent soils of minor extent.

Neshaminy soils are gently sloping to very steep. They are on ridges and hills. They overlie diabase bedrock at a depth greater than 72 inches. They are very deep and well drained.

Lehigh soils are nearly level to strongly sloping. They are on ridgetops and side slopes. They are channery throughout and overlie porcelanite bedrock at a depth of 42 inches. They are deep and somewhat poorly drained.

The soils of minor extent are Legore, Penn, Mount Lucas, Croton, and Watchung soils. The well drained Legore and Penn soils are on narrow ridges and long side slopes. The somewhat poorly drained Mount Lucas soils are on foot slopes. The poorly drained Croton and Watchung soils are in depressions and drainageways on lowlands. A few, small areas of Urban land are scattered throughout the map unit. Gifford Pinchot State Park, a ski resort, and two State Game Lands are in this map unit.

In most areas the soils in this map unit are used as cropland, orchards, woodland, and recreation areas. In some areas they are used for urban development. The major crops are corn, soybeans, small grain, fruit, hay, and pasture. Slope is the major limitation. Erosion is the major hazard.

These soils are well suited to generally unsuited to cultivated crops and specialty crops. They are fairly well suited to improved pasture. On the steeper slopes, erosion is a severe hazard and hay crops are impractical. These soils are suitable to woodland use. On the steeper slopes, however, use of logging roads and skid trails is restricted. Slope generally is a severe limitation to urban uses. On Neshaminy soils, it is a difficult limitation to overcome. On Lehigh soils, depth to bedrock and wetness are severe limitations for urban development and sanitary facilities. Suitability is poor for recreation development because of slope on Neshaminy soils and wetness on Lehigh soils.

12. Glenelg-Mt. Airy

Gently sloping to moderately steep, moderately deep and deep, well drained and somewhat excessively drained soils formed in residuum derived from schist and phyllite; on ridges and hills

These soils are on dissected uplands and in depressions and drainageways. In most areas they are undulating to rolling, but in some areas they are hilly and moderately steep.

This map unit makes up about 2 percent of the

county. It is about 55 percent Glenelg soils, 35 percent Mt. Airy soils, and 10 percent minor soils.

Glenelg soils are gently sloping to moderately steep. They are on narrow ridgetops and side slopes. These soils overlie schist and phyllite bedrock at a depth of 40 to 60 inches. They are deep and well drained.

Mt. Airy soils are gently sloping to moderately steep. They are on ridges, hills, and narrow side slopes. They are channery throughout and overlie schist and phyllite bedrock at a depth of 20 to 40 inches. They are moderately deep and somewhat excessively drained.

The soils of minor extent are Manor, Glenville, Baile, and Codorus soils. The somewhat excessively drained Manor soils are on narrow ridges and hills. The moderately well drained Glenville soils and the poorly drained Baile soils are on lowlands. The moderately well drained Codorus soils are on bottom lands and flood plains.

In most areas the soils of this map unit are used for cropland, pasture, and woodland. In some areas they are used for urban or recreation development. The major crops are corn, soybeans, small grain, hay, and pasture. Slope is the major limitation. Erosion is the major hazard.

These soils are generally well suited or suited to cultivated crops and specialty crops. They are fairly well suited to improved pasture. On the steeper slopes erosion is a severe hazard and hay crops are impractical. These soils are suited to woodland use. On the steeper slopes, however, use of logging roads and skid trails is restricted. These soils are generally unsuited to urban use because slope and depth to bedrock are severe limitations. Slope and depth to bedrock are difficult limitations to overcome. Suitability is poor for recreation development because of steep slopes.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the county. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the substratum, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Chester silt loam, 3 to 8 percent slopes, is a phase of the Chester series.

Some map units are made up of two or more major soils. These map units are called soil complexes or undifferentiated groups.

A *soil complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Penn-Lansdale complex, 3 to 8 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in the mapped areas are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Mt. Airy and Manor soils, 15 to 25 percent slopes, is an undifferentiated group in this survey area.

Most map units include small, scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. These dissimilar soils are described in each map unit. Also, some of the more unusual or strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes some *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, quarries, is an example. Some miscellaneous areas are large enough to be delineated on the soil maps. Some that are too small to be delineated are identified by a special symbol on the soil maps.

The name, descriptions, and delineations of soils on the detailed soil maps of York County do not always agree or join fully with those of the soils identified on the maps of adjoining counties published at an earlier date. Some differences are the result of changes in concepts of soil series. Other differences result from variations in the extent of the soils or of variations in the slope range allowed in the map units of adjoining counties.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Tables" under "Contents") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

ArB—Arendtsville gravelly loam, 3 to 8 percent slopes

This is a gently sloping, very deep, well drained soil on ridgetops. Slopes are smooth or convex. Areas of this soil are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark reddish brown, friable gravelly loam about 9 inches thick. The subsoil is about 44 inches thick. It is reddish brown, friable gravelly loam to a depth of 16 inches; dark reddish brown and dark red, friable gravelly sandy clay loam to a depth of 30 inches; and dark red, friable gravelly sandy loam to a depth of 43 inches. The substratum to a depth of 72 inches is reddish brown and weak red, friable very gravelly sandy loam. In some areas the soil is nearly level and strongly sloping. In some areas it contains more silt and clay or the subsoil is yellowish brown and brown.

Included with this soil in mapping are a few, scattered areas of very deep, well drained Lewisberry soils and deep, moderately well drained Readington soils. Lewisberry soils have more sand throughout and are in landscape positions similar to those of the Arendtsville soil. Readington soils have gray mottles in the middle and lower parts of the subsoil. They are in depressions on broad uplands. Also included are a few, gullied areas and areas where a few, large sandstone fragments are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability in the Arendtsville soil is moderate or moderately rapid. Available water capacity is moderate. Surface runoff is medium. In unlimed areas this soil is extremely acid to moderately acid in the upper part of the solum and extremely acid to strongly acid in the lower part and in the substratum.

In most areas this soil is used for orchards or woodland. In a few areas it is used for cropland, pasture, or idle land.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain the organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Seepage is a severe limitation for onsite waste disposal. The soil is suitable as sites for dwellings and most other urban uses. Low strength and frost action are moderate limitations for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

ArC—Arendtsville gravelly loam, 8 to 15 percent slopes

This is a strongly sloping, very deep, well drained soil on ridgetops and side slopes. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark reddish brown, friable gravelly loam about 9 inches thick. The subsoil is about 44 inches thick. It is reddish brown, friable gravelly loam to a depth of 16 inches; dark reddish brown and dark red, friable gravelly sandy clay loam to a depth of 30 inches; and dark red, friable gravelly sandy loam to a depth of 43 inches. The substratum to a depth of 72 inches is reddish brown and weak red, friable very gravelly sandy loam. In some areas the soil is nearly level and moderately steep. In some areas the soil has more silt and clay or the subsoil is yellowish brown and brown.

Included with this soil in mapping are a few, scattered areas of very deep, well drained Lewisberry soils and deep, moderately well drained Readington soils. Lewisberry soils contain more sand throughout and are in landscape positions similar to those of the Arendtsville soil. Readington soils have gray mottles in the middle and lower parts of the subsoil. They are in depressions on broad uplands. Also included are a few, gullied areas and areas where a few, large sandstone fragments are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability of the Arendtsville soil is moderate or moderately rapid. Available water capacity is moderate.

Surface runoff is rapid. In unlimed areas this soil is extremely acid to moderately acid in the upper part of the solum and extremely acid to strongly acid in the lower part and in the substratum.

In most areas this soil is used for orchards. In some areas it is used for cropland, pasture, or woodland.

This soil is well suited to specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping system that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain the organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Seepage and slope are severe limitations for onsite waste disposal. Slope is a moderate limitation for dwellings and most other urban uses. Slope, low strength, and frost action are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4A.

ArD—Arendtsville gravelly loam, 15 to 25 percent slopes

This is a moderately steep, very deep, well drained soil on ridges and hillsides. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark reddish brown, friable gravelly loam about 9 inches thick. The subsoil is about 44 inches thick. It is reddish brown, friable gravelly loam to a depth of 16 inches; dark reddish brown and dark red, friable gravelly sandy clay loam to a depth of 30 inches; and dark red, friable gravelly sandy loam to a depth of 43 inches. The substratum to a depth of 72 inches is reddish brown and weak red, friable very gravelly sandy loam. In some areas the soil is strongly sloping and steep. In some areas the solum has more silt and clay or the subsoil is yellowish brown and brown.

Included with this soil in mapping are a few, scattered areas of very deep, well drained Lewisberry soils on narrow ridges. These soils have more sand throughout than the Arendtsville soil. Also included are a few, gullied areas and areas where a few, large sandstone fragments are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability of the Arendtsville soil is moderate or moderately rapid. Available water capacity is moderate. Surface runoff is rapid. In unlimed areas this soil is extremely acid to moderately acid in the upper part of the solum and extremely acid to strongly acid in the lower part of the solum and in the substratum.

In most areas this soil is used for orchards or woodland. In some areas it is used for cropland or pastureland.

This soil is well suited to specialty crops. It is poorly suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain the organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. Erosion hazard and the equipment limitation are the main management concerns. Constructing roads on the contour helps to reduce slope and to control erosion. Slope restricts use of equipment. Machine planting is practical in large areas.

Seepage and slope are severe limitations for onsite

waste disposal. Slope is a severe limitation for dwellings, most other urban uses, and local roads and streets.

The land capability classification is 4E. The woodland ordination symbol is 4R.

AtB—Athol gravelly silt loam, 3 to 8 percent slopes

This is a gently sloping, very deep, well drained soil on undulating, broad uplands and benches. Areas of this soil are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark reddish brown, friable gravelly silt loam about 10 inches thick. The subsoil is about 42 inches thick. It is reddish brown, friable silt loam to a depth of 24 inches and reddish brown, friable silty clay loam to a depth of 52 inches. The substratum to a depth of 60 inches is reddish brown, firm gravelly silt loam. In some areas the soil is nearly level and strongly sloping. In some areas it has more sand. In some areas the subsoil is yellowish brown and brown. In some areas depth to bedrock is less than 60 inches. In some areas it is silt loam, loam, gravelly loam, and gravelly sandy loam.

Included with this soil in mapping are a few, scattered areas of nearly level, somewhat poorly drained Penlaw soils on broad uplands and in depressions on lowlands. Also included are a few, narrow, elongated areas of moderately well drained Readington soils in shallow depressions on broad uplands. Included soils make up about 15 percent of the map unit.

Permeability of this Athol soil is moderate. Available water capacity is moderate or high. Surface runoff is medium. In unlimed areas this soil is very strongly acid to slightly acid in the upper part of the solum, strongly acid or moderately acid in the lower part, and strongly acid to slightly acid in the substratum.

In most areas this soil is used for cropland. In a few areas it is used for orchards, pasture, or urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard if cultivated crops are grown. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a system of conservation tillage that leaves protective amounts of crop residue on the surface, diversions, contour stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain the organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock and moderate permeability are moderate limitations for onsite waste disposal. This soil is suitable as sites for dwellings without basements. Moderate permeability is a moderate limitation for dwellings with basements and most other urban uses. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

AtC—Athol gravelly silt loam, 8 to 15 percent slopes

This is a strongly sloping, very deep, well drained soil on foot slopes, benches, and side slopes. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark reddish brown, friable gravelly silt loam about 10 inches thick. The subsoil is about 42 inches thick. It is reddish brown, friable silt loam to a depth of 24 inches and reddish brown, friable silty clay loam to a depth of 52 inches. The substratum to a depth of 60 inches is reddish brown, firm gravelly silt loam. In some areas the soil is gently sloping and moderately steep or has more sand. In some areas the subsoil is yellowish brown and brown or depth to bedrock is less than 60 inches. In some areas the surface layer is channery silt loam, channery loam, and gravelly loam.

Included with this soil in mapping are a few, scattered areas of nearly level, somewhat poorly drained Penlaw soils on broad uplands and in depressions on lowlands. Also included are a few, narrow, elongated areas of moderately well drained Readington soils in shallow depressions on broad uplands. Included soils make up about 15 percent of the map unit.

Permeability of this Athol soil is moderate. Available water capacity is moderate or high. Surface runoff is

rapid. In unlimed areas this soil is very strongly acid to slightly acid in the upper part of the solum, strongly acid or moderately acid in the lower part, and strongly acid to slightly acid in the substratum.

In most areas this soil is used for cropland or pasture. In a few areas it is used for orchards, woodland, or urban development.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard if cultivated crops are grown. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock, moderate permeability, and slope are moderate limitations for onsite waste disposal. Slope is a moderate limitation for dwellings and most other urban uses. Moderate permeability is a problem for dwellings with basements. Slope and frost action are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4A.

Ba—Baile silt loam

This is a nearly level, very deep, poorly drained soil on lowlands and in depressions and drainageways. Slopes are smooth or concave and range from 0 to 3 percent. Areas of this soil are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark grayish brown, mottled, friable silt loam about 4 inches thick. The subsurface layer is light brownish gray, mottled, friable silt loam 8 inches thick. The subsoil is grayish brown, firm silt loam about 28 inches thick. The substratum to a depth of 60 inches is grayish brown, mottled, friable channery silt loam. In some areas the soil is gently sloping. In some areas the subsoil is brown or depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, small areas of very deep, moderately well drained Codorus soils and poorly drained Hatboro soils in lower, nearly level or slight depressions on bottom lands. Also included, where slope is more than 3 percent, are a few, small areas of moderately well drained Glenville soils. Also included are some areas where a few, large sandstone fragments are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability of this Baile soil is moderately slow in the surface layer, slow in the subsoil, and slow or moderately slow in the substratum. Available water capacity is high, but rooting depth is restricted by the high water table. The seasonal high water is within 6 inches of the surface most of the year. Surface runoff is slow or ponded. In unlimed areas this soil is extremely acid to strongly acid.

In most areas this soil is used for pasture or woodland, or is idle land. It is unsuited to cultivated crops and poorly suited to permanent pasture because of wetness and flooding.

Potential productivity for trees on this soil is moderately high. Water-tolerant species are favored in timber stands. The equipment limitation and seedling mortality are major management concerns. The high water table restricts use of equipment to midsummer, when the soil is dry, or to midwinter, when the soil is frozen or has a protective cover of snow. Special site preparation, such as bedding before planting, helps to reduce the seedling mortality rate. Seedlings survive and grow well if competing vegetation is controlled, especially during the first few years, and if livestock is excluded from wooded areas. Machine planting is practical in large areas.

This soil is unsuited to use as sites for onsite waste disposal and dwellings because flooding and wetness are severe limitations. Flooding, wetness, and frost action are severe limitations for local roads and streets.

The land capability classification is 5W. The woodland ordination symbol is 4W.

Be—Bermudian silt loam

This is a nearly level, very deep, well drained soil on flood plains. Slopes are smooth and range from 0 to 3

percent. Areas of this soil are long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark reddish brown, mottled, friable silt loam about 8 inches thick. The subsoil is about 42 inches thick. It is dark reddish brown, friable silt loam to a depth of 30 inches and reddish brown, friable silty clay loam to a depth of 50 inches. The substratum to a depth of 72 inches is reddish brown, loose, stratified sand and gravel. In some areas the solum is loam and sandy loam. In some areas the soil has more sand. In other areas depth to stratified sand and gravel is less than 40 inches.

Included with this soil in mapping are a few, small areas of well drained Birdsboro soils on narrow stream terraces and along the top of breaks to bottom lands. Also included are some areas of soils that are subject to rare flooding. Included soils make up about 10 percent of the map unit.

Permeability of this Bermudian soil is moderate or moderately rapid in the solum and rapid in the substratum. Available water capacity is moderate. Surface runoff is slow. This soil is subject to occasional flooding for brief periods, mainly in late winter and early spring. In unlimed areas this soil is very strongly acid to moderately acid.

In most areas this soil is used for cropland. In some small areas it is used for pasture or woodland or is idle land.

This soil is well suited to corn and soybeans. It is not as suited to small grain, however, because floodwater causes severe crop damage. Occasional flooding is the main hazard. Crop residue management, cover crops, and green manure crops help to maintain the organic matter content and to improve soil tilth.

This soil is suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

This soil is unsuited as sites for onsite waste disposal and dwellings because flooding is a severe limitation. Flooding and low strength are severe limitations for local roads and streets.

The land capability classification is 1. The woodland ordination symbol is 4A.

BgA—Birdsboro silt loam, 0 to 3 percent slopes

This is a nearly level, very deep, well drained soil on terraces and benches above flood plains of large streams. Slopes are smooth. Areas of this soil are oval or elongated in shape and range from 5 to 25 acres in size.

Typically, the surface layer is dark reddish brown, friable silt loam about 10 inches thick. The subsoil is about 40 inches thick. It is reddish brown, friable gravelly silt loam to a depth of 18 inches; reddish brown, friable silt loam to a depth of 30 inches; and yellowish red, firm silty clay loam to a depth of 50 inches. The subsoil is mottled between depths of 40 and 50 inches. The substratum to a depth of 60 inches is reddish brown, very firm silt loam. In some areas the soil is gently sloping or has more sand. In some areas the solum is loam and sandy loam or depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, small areas of Bermudian soils, poorly drained Lamington soils, and moderately well drained Raritan soils. Bermudian soils are in narrow drainageways and on small flats on bottom lands. Lamington and Raritan soils are on low terraces. Also included are areas of soils that are ponded during periods of heavy rainfall. Included soils make up about 15 percent of the map unit.

Permeability of this Birdsboro soil is moderate. Available water capacity is moderate or high. Surface runoff is slow. In unlimed areas this soil is extremely acid to strongly acid.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. A conservation tillage system that leaves protective amounts of crop residue on the surface, cover crops, and green manure crops help to maintain the organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing,

applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Poor filter is a severe limitation for onsite waste disposal. The soil is suitable to use as sites for dwellings without basements. It is moderately limited as a site for dwellings with basements. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 1. The woodland ordination symbol is 4A.

BgB—Birdsboro silt loam, 3 to 8 percent slopes

This is a gently sloping, very deep, well drained soil on terraces and benches above flood plains of large streams. Slopes are smooth and convex. Areas of this soil are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark reddish brown, friable silt loam about 10 inches thick. The subsoil is about 40 inches thick. It is reddish brown, friable gravelly silt loam to a depth of 18 inches; reddish brown, friable silt loam to a depth of 30 inches; and yellowish red, firm silty clay loam to a depth of 50 inches. The subsoil is mottled between depths of 40 and 50 inches. The substratum to a depth of 60 inches is reddish brown, very firm silt loam. In some areas the soil is nearly level. In some areas the subsoil is brown and yellowish brown or the solum is loam and sandy loam. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, small areas of Bermudian soils, poorly drained Lamington soils, and moderately well drained Raritan soils. Bermudian soils are in narrow drainageways and on small flats on bottom lands. Lamington and Raritan soils are on low terraces. Also included are areas of soils that are ponded during periods of heavy rainfall. Included soils make up about 15 percent of the map unit.

Permeability of this Birdsboro soil is moderate. Available water capacity is moderate or high. Surface runoff is medium. In unlimed areas this soil is extremely acid to strongly acid.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain the organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Poor filter is a severe limitation for onsite waste disposal. The soil is suitable as sites for dwellings without basements. Moderate permeability is a moderate limitation for dwellings with basements. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

BgC—Birdsboro silt loam, 8 to 15 percent slopes

This is a strongly sloping, very deep, well drained soil on side slopes of terraces and benches above flood plains of large streams. Slopes are convex. Areas of this soil are long and narrow in shape and range from 5 to 15 acres in size.

Typically, the surface layer is dark reddish brown, friable silt loam about 10 inches thick. The subsoil is about 40 inches thick. It is reddish brown, friable gravelly silt loam to a depth of 18 inches; reddish brown, friable silt loam to a depth of 30 inches; and yellowish red, firm silty clay loam to a depth of 50 inches. The subsoil is mottled between depths of 40 and 50 inches. The substratum to a depth of 60 inches is reddish brown, very firm silt loam. In some areas the soil is gently sloping and moderately steep or has more sand. In some areas the subsoil is brown and yellowish brown or the solum is loam and sandy loam. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, small areas of Bermudian soils, poorly drained Lamington

soils, and moderately well drained Raritan soils. Bermudian soils are in narrow drainageways and on small flats on bottom lands. Lamington and Raritan soils are on low terraces. Also included are small areas where large sandstone fragments are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability of the Birdsboro soil is moderate. Available water capacity is moderate or high. Surface runoff is rapid. In unlimed areas this soil is extremely acid to strongly acid.

In most areas this soil is used for cropland or pasture. In some areas it is used for woodland or is idle land.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping system that includes grasses and legumes, a system of conservation tillage that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain the organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is high. No major hazards or limitations affect use and management. Machine planting is practical in large areas.

Poor filter and slope are severe limitations for onsite waste disposal. Slope is a moderate limitation for dwellings and most other urban uses. Slope and frost action are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4A.

Bo—Bowmansville silt loam

This is a nearly level, very deep, somewhat poorly drained soil on flood plains. Slopes are smooth and range from 0 to 3 percent. Areas of this soil are long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, very friable silt loam about 11 inches thick. The subsoil is about 23 inches thick. It is reddish brown, mottled, friable silt loam to a depth of 14 inches and reddish gray, mottled, friable silt loam to a depth of 34 inches. The substratum extends to a depth of 72 inches or more. It is pinkish gray, mottled, firm stratified silt loam and silty clay loam to a depth of 55 inches and dark reddish gray, mottled, firm gravelly sandy loam to a depth of 72 inches. In some areas the solum has more sand or the subsoil is brown. In some areas depth to bedrock is less than 60 inches or stratified sand and gravel is at a depth of less than 40 inches.

Included with this soil in mapping are a few, small areas of poorly drained Croton and Lamington soils on lowlands and broad flats on uplands. These soils are grayish throughout. Also included are moderately well drained Rowland soils on slightly higher parts of bottom lands that are subject to rare flooding. Included soils make up about 15 percent of the map unit.

Permeability of the Bowmansville soil is moderate in the surface layer, moderately slow in the subsoil, and moderate or moderately slow in the substratum. Available water capacity is high, but rooting depth is restricted by the seasonal high water table, which is at a depth of 6 to 18 inches in most months. Surface runoff is slow. The soil is subject to frequent flooding for brief periods, mainly in late winter or early spring. If unlimed this soil is strongly acid to slightly acid in the solum and strongly acid to neutral in the substratum.

In most areas this soil is used for pasture or woodland or is idle land.

This soil is fairly well suited to water-tolerant cultivated crops planted late in spring. It is unsuited to small grain because floodwater causes severe crop damage. Existing, well maintained dikes, levees, and drainage systems help to overcome flooding and wetness. A conservation tillage system that leaves protective amounts of crop residue on the surface, cover crops, and green manure crops help to maintain the organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. Water-tolerant species are favored in timber stands. The equipment limitation, seedling mortality, and windthrow hazard are major management concerns. The high water table restricts use of equipment to midsummer, when the soil is dry, or to midwinter, when the soil is frozen or has a protective cover of snow. Special site preparation, such as bedding before planting, helps to reduce the seedling mortality rate. Harvesting without isolating the remaining trees or leaving them widely spaced helps to prevent windthrow. Machine planting is practical in large areas.

This soil is unsuited to use as sites for onsite waste disposal and dwellings because flooding and wetness are severe limitations. Wetness, flooding, and frost action are severe limitations for local roads and streets.

The land capability classification is 3W. The woodland ordination symbol is 5W.

BrB—Brecknock channery silt loam, 3 to 8 percent slopes

This is a gently sloping, deep, well drained soil on ridgetops. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 200 acres in size.

Typically, the surface layer is dark brown, very friable channery silt loam about 3 inches thick. The subsurface layer is dark grayish brown, friable channery silt loam about 4 inches thick. The subsoil is about 23 inches thick. It is brown, friable channery silt loam to a depth of 12 inches; brown, mottled, friable silt loam to a depth of 24 inches; and brown, mottled, firm silt loam to a depth of 30 inches. The substratum to a depth of 42 inches is brown, very firm, very channery silt loam. Fractured, porcelanite bedrock is at a depth of about 42 inches. In some areas the soil is nearly level. In some areas the solum is less than 24 inches thick or depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, scattered areas of nearly level, somewhat poorly drained Lehigh soils on broad ridgetops. Also included are some small areas where many large sandstone fragments are on or below the surface. Included areas make up about 10 percent of the map unit.

Permeability of this Brecknock soil is moderate. Available water capacity is low. Surface runoff is medium. In unlimed areas this soil is very strongly acid to slightly acid.

In most areas this soil is used for cropland, pasture, or woodland.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock and moderate permeability are moderate limitations for onsite waste disposal. The soil is suitable as sites for dwellings without basements. Depth to bedrock is a moderate limitation for dwellings with basements and most other urban uses. Low strength and frost action are moderate limitations for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

BrC—Brecknock channery silt loam, 8 to 15 percent slopes

This is a strongly sloping, deep, well drained soil on ridgetops and side slopes. Slopes are smooth and convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, very friable channery silt loam about 3 inches thick. The subsurface layer is dark grayish brown, friable channery silt loam about 4 inches thick. The subsoil is about 23 inches thick. It is brown, friable channery silt loam to a depth of 12 inches; brown, mottled, friable silt loam to a depth of 24 inches; and brown, mottled, firm silt loam to a depth of 30 inches. The substratum to a depth of 42 inches is brown, very firm very channery silt loam. Fractured, porcelanite bedrock is at

a depth of about 42 inches. In some areas the soil is nearly level. In some areas the solum is less than 24 inches thick or depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, scattered areas of gently sloping, somewhat excessively drained Klinesville soils on narrow ridges and hills. Also included are some small areas where many large sandstone fragments are on or below the surface. Included areas make up about 10 percent of the map unit.

Permeability of this Brecknock soil is moderate. Available water capacity is low. Surface runoff is rapid. In unlimed areas this soil is very strongly acid to slightly acid.

In most areas this soil is used for cropland, pasture, or woodland. In some areas it is used for urban development.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock, slope, and moderate permeability are moderate limitations for onsite waste disposal. Slope is a moderate limitation for dwellings without basements. Depth to bedrock and slope are moderate limitations for dwellings with basements and most other urban uses. Depth to bedrock and slope are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4A.

BrD—Brecknock channery silt loam, 15 to 25 percent slopes

This is a moderately steep, deep, well drained soil on ridges and hills. Slopes are smooth and convex. Areas of this soil are long and narrow in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark brown, very friable channery silt loam about 3 inches thick. The subsurface layer is dark grayish brown, friable channery silt loam about 4 inches thick. The subsoil is about 23 inches thick. It is brown, friable channery silt loam to a depth of 12 inches; brown, mottled, friable silt loam to a depth of 24 inches; and brown, mottled, firm silt loam to a depth of 30 inches. The substratum to a depth of 42 inches is brown, very firm very channery silt loam. Fractured, porcelanite bedrock is at a depth of about 42 inches. In some areas the soil is strongly sloping and steep. In some areas the solum is less than 24 inches thick. In some areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, scattered areas of strongly sloping, somewhat excessively drained Klinesville soils on narrow ridges and hills. Also included are some small areas where many, large sandstone fragments are on or below the surface. Also included are some areas where sandstone and shale bedrock is exposed in the lower part of some draws. Included areas make up about 10 percent of the map unit.

Permeability of this Brecknock soil is moderate. Available water capacity is low. Surface runoff is rapid. In unlimed areas this soil is very strongly acid to slightly acid.

In most areas this soil is used for pasture or woodland or is idle land.

This soil is fairly well suited to most specialty crops. It is poorly suited to corn, soybeans, and small grain in areas where slope is less than 18 percent. It is unsuited to cultivated crops in areas where slope is more than 18 percent. Erosion is the major hazard. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain the organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage

yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. When the soil is wet, logging roads tend to be slippery and ruts form quickly. Use of planting or logging equipment is limited during wet periods. Thinning or removing undesirable species is a suitable management practice. Machine planting is generally practical in large areas.

Slope is a severe limitation for onsite waste disposal, dwellings, and local roads and streets.

The land capability classification is 4E. The woodland ordination symbol is 4R.

BsD—Brecknock channery silt loam, 8 to 25 percent slopes, very stony

This is a strongly sloping and moderately steep, deep, well drained soil on ridges and hills. Slopes are smooth and convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 200 acres in size. Stones and boulders that range in size from 1 to more than 3 feet across cover 1 to 3 percent of the surface.

Typically, the surface layer is dark brown, very friable channery silt loam about 3 inches thick. The subsurface layer is dark grayish brown, friable channery silt loam about 4 inches thick. The subsoil is about 23 inches thick. It is brown, friable channery silt loam to a depth of 12 inches; brown, mottled, friable silt loam to a depth of 24 inches; and brown, mottled, firm silt loam to a depth of 30 inches. The substratum to a depth of 42 inches is brown, very firm, very channery silt loam. Fractured, porcelanite bedrock is at a depth of about 42 inches. In some areas the soil is strongly sloping and steep. In some areas the solum is less than 24 inches or depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, scattered areas where many large sandstone fragments are on or below the surface. Also included are a few areas where sandstone and shale bedrock is exposed in the lower part of some draws. Included areas make up about 10 percent of the map unit.

Permeability of this Brecknock soil is moderate. Available water capacity is low. Surface runoff is rapid. In unlimed areas this soil is very strongly acid to slightly acid.

In most areas this soil is used for woodland or is idle land. In some areas it is used for urban development.

This soil is unsuited to cultivated crops and poorly suited to grasses and legumes for permanent pasture because of stones and boulders on and below the surface. Farm machinery operable on strongly sloping and moderately steep slopes is needed for seedbed preparation. Permanent stands of grasses and legumes help to reduce runoff and to control erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. Operating ordinary crawler tractors and rubber-tired skidders can be hazardous because of slope. Thinning and removing undesirable species are suitable management practices. Slope, stones, and boulders restrict machine planting.

Slope is a severe limitation for onsite waste disposal, dwellings, and local roads and streets.

The land capability classification is 6S. The woodland ordination symbol is 4R.

BsF—Brecknock channery silt loam, 25 to 60 percent slopes, very stony

This is a steep and very steep, deep, well drained soil on ridges and hills. Slopes are smooth and convex. Areas of this soil are long and narrow in shape and range from 5 to 200 acres in size. Stones and boulders that range from 1 to 3 feet in size cover about 1 to 3 percent of the surface.

Typically, the surface layer is dark brown, very friable channery silt loam about 3 inches thick. The subsurface layer is dark grayish brown, friable channery silt loam about 4 inches thick. The subsoil is about 23 inches thick. It is brown, friable channery silt loam to a depth of 12 inches; brown, mottled, friable silt loam to a depth of 24 inches; and brown, mottled, friable silt loam to a depth of 30 inches. The substratum to a depth of 42 inches is brown, very firm channery silt loam. Fractured, porcelanite bedrock is at a depth of 42 inches. In some areas the soil is moderately steep. In some areas the solum is less than 24 inches or depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small,

scattered areas of soils without stones on the surface and where slope is 8 to 15 percent. Also included are some areas where many, large sandstone fragments and boulders are on or below the surface. Also included are areas where sandstone and shale bedrock is exposed in the lower part of some draws. Included areas make up about 10 percent of the map unit.

Permeability of this Brecknock soil is moderate. Available water capacity is low. Runoff is very rapid. In unlimed areas this soil is very strongly acid to slightly acid.

In most areas this soil are used as woodland or is idle land.

It is unsuited to cultivated crops and poorly suited to grasses and legumes for permanent pasture because of slope and stones and boulders on and below the surface. Machinery operable on steep and very steep slopes is needed for seedbed preparation. Permanent stands of grasses and legumes help to reduce surface runoff and to control erosion. Overgrazing and grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction and poor tilth. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. Ordinary crawler tractors and rubber-tired skidders cannot be operated safely on these slopes.

This soil is unsuited to use as sites for onsite waste disposal, dwellings, and local roads and streets because of slope.

The land capability classification is 7S. The woodland ordination symbol is 4R.

CcC—Catoctin channery silt loam, 8 to 15 percent slopes

This is a strongly sloping, moderately deep, somewhat excessively drained soil on ridgetops and side slopes. Slopes are smooth and convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 25 acres in size.

Typically, the surface layer is dark brown, friable channery silt loam about 9 inches thick. The subsoil is yellowish brown, friable very channery silt loam about 7 inches thick. The substratum to a depth of 24 inches is brown, friable extremely channery silt loam. Bedrock is at a depth of 24 inches. In some areas the soil is gently sloping and moderately steep. In some areas depth to bedrock is less than 20 inches.

Included with this soil in mapping are a few, scattered areas of very deep, well drained Edgemont soils and deep Highfield soils on the edges of broad ridgetops. These soils have more clay and less sand and rock fragments throughout than the Catoctin soil. Included soils make up about 15 percent of the map unit.

Permeability of this Catoctin soil is moderately rapid. Available water capacity is low or very low. Surface runoff is rapid. In unlimed areas this soil is strongly acid to slightly acid in the solum and moderately acid to neutral in the substratum. Depth to bedrock restricts root penetration.

In most areas this soil is used for orchards. In some areas it is used for cropland, pastureland, woodland or is idle land.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard and low or very low available water capacity is the main limitation if cultivated crops are grown. Conservation management practices are needed to reduce runoff and to control erosion. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderate. The seedling mortality and the windthrow hazard are major management concerns. Selecting proper planting stock and stocking rates help to reduce seedling mortality. Harvesting without isolating the remaining trees or leaving them widely spaced helps to prevent windthrow. Machine planting is practical in large areas.

Depth to bedrock is a severe limitation for onsite waste disposal and dwellings with basements. Depth to

bedrock and slope are moderate limitations for dwellings without basements, most other urban uses, and local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 3F.

Cd—Chagrin silt loam

This is a nearly level, very deep, well drained soil on flood plains. Slopes are smooth and range from 0 to 3 percent. Areas of this soil are long and narrow in shape and range from 5 to 200 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 10 inches thick. The subsoil is about 26 inches thick. It is brown and yellowish brown, friable silt loam to a depth of 20 inches; yellowish brown, friable loam to a depth of 32 inches; and yellowish brown, friable sandy loam to a depth of 36 inches. The substratum to a depth of 60 inches is stratified, yellowish brown, very friable sandy loam and brown, very friable loamy fine sand. In some areas the soil has more silt and sand. In some areas depth to bedrock is less than 60 inches or depth to stratified sand and gravel is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas of moderately well drained Codorus and Lindside soils on slight rises and Elk soils on low stream terraces. Codorus and Lindside soils have low chroma mottles in the lower part of the subsoil. Elk soils are less sandy than the Chagrin soil. Also included are a few areas of soils that are subject to rare flooding or that are subject to frequent flooding during periods of heavy rainfall. Included soils make up about 15 percent of the map unit.

Permeability of this Chagrin soil is moderate. Available water capacity is moderate or high. Surface runoff is slow. This soil is subject to occasional flooding for brief periods, mainly in late winter and early spring. In unlimed areas it is moderately acid to neutral.

In most areas this soil is used for cropland and pasture. In some small areas it is used for woodland or is idle land.

It is well suited to corn and soybeans. It is not well suited to small grain, however, because of severe crop damage caused by floodwater. Occasional flooding is a hazard. Existing, well maintained dikes and levees help to overcome flooding. Crop residue management, cover crops, and green manure crops help to maintain organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards and limitations affect use and management. Machine planting is practical in large areas.

This soil is unsuited to use as sites for onsite waste disposal, dwellings, and local roads and streets because flooding is a severe limitation.

The land capability classification is 2W. The woodland ordination symbol is 5A.

CeB—Chester silt loam, 3 to 8 percent slopes

This is a gently sloping, very deep, well drained soil on broad ridgetops. Slopes are smooth or convex. Areas of this soil are irregular and long and narrow in shape and range from 5 to 500 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 11 inches thick. The subsoil is about 29 inches thick. It is strong brown, friable silt loam to a depth of 17 inches; strong brown, friable silty clay loam and silt loam to a depth of 36 inches; and reddish brown, friable loam to a depth of 40 inches. The substratum to a depth of 60 inches is strong brown, friable and very friable channery sandy loam that is very micaceous. In some areas the soil is nearly level and strongly sloping. In some areas it has more clay. In a few areas it is less acid.

Included with this soil in mapping are a few, scattered areas of moderately well drained Glenville soils on broad lowlands, in depressions, and along drainageways. These soils are grayish in the middle and lower parts of the subsoil. Also included are a few, eroded areas and areas where a few, large sandstone, schist and other crystalline rock fragments are on or below the surface. Included soils make up about 10 percent of the map unit.

Permeability of this Chester soil is moderate. Available water capacity is moderate or high. Surface runoff is medium. In unlimed areas this soil is very strongly acid or strongly acid.

In most areas this soil is used for cropland. In some areas it is used for pasture or woodland. In a few areas it is used for urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard if cultivated crops are grown. Conservation management practices are needed to reduce surface

runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping (fig. 10), and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Permeability is a moderate limitation for onsite waste disposal. This soil is suitable as sites for dwellings. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

CeC—Chester silt loam, 8 to 15 percent slopes

This is a strongly sloping, very deep, well drained soil on foot slopes, benches, and side slopes. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 11 inches thick. The subsoil is about 29 inches thick. It is strong brown, friable silt loam to a depth of 17 inches; strong brown, friable silty clay loam and silt loam to a depth of 36 inches; and reddish brown, friable loam to a depth of 40 inches. The substratum to a depth of 60 inches is strong brown, friable and very friable channery sandy loam that is very micaceous. In some areas the soil is gently sloping and moderately steep or has more clay. In

Figure 10.—Contour stripcropping helps to reduce runoff and to control erosion. The soil is Chester silt loam, 3 to 8 percent slopes.

some areas the soil is less acid or depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, scattered areas of very deep, somewhat excessively drained Manor soils and moderately deep Mt. Airy soils on ridges, hills, and the steeper side slopes. These soils contain less clay than the Chester soil. Also included are a few, eroded areas and areas where a few, large sandstone, schist, and other crystalline rock fragments are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability of this Chester soil is moderate. Available water capacity is moderate or high. Surface runoff is rapid. In unlimed areas this soil is very strongly acid or strongly acid.

In most areas this soil is used for cropland and pasture. In a few areas it is used for orchards, woodland, or urban development.

This soil is well suited to most speciality crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards and limitations affect use and management. Machine planting is practical in large areas.

Moderate permeability and slope are moderate limitations for onsite waste disposal. Slope is a moderate limitation for dwellings and most other urban uses. Slope and frost action are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4A.

CkA—Clarksburg silt loam, 0 to 3 percent slopes

This is a nearly level, very deep, moderately well drained soil on broad uplands and in depressions. Slopes are smooth or concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 25 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 8 inches thick. The subsoil is about 46 inches thick. It is yellowish brown, friable silt loam to a depth of 16 inches; yellowish brown, mottled, friable and firm silt loam to a depth of 32 inches; yellowish brown, firm and brittle silty clay loam to a depth of 40 inches; and brown and yellowish brown, firm and brittle clay loam to a depth of 54 inches. The substratum to a depth of 60 inches is yellowish brown, mottled, friable very channery clay loam. In some areas the soil is gently sloping or has no fragipan. In some areas the solum is loam less than 20 inches thick or depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, small areas of very deep, well drained Conestoga, Duffield, and Hagerstown soils on broad ridgetops. These soils do not have a fragipan. Hagerstown soils have more clay than the Clarksburg soil. Also included are areas where a few, large sandstone, schist, and other crystalline rock fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability of this Clarksburg soil is moderate above the fragipan and slow or moderately slow in the fragipan and the substratum. Available water capacity is moderate or high. Surface runoff is slow. The fragipan is at a depth of 20 to 36 inches. The seasonal high water table is at a depth of 18 to 36 inches. In unlimed areas this soil is strongly acid to slightly acid. The fragipan and the seasonal high water table restrict root penetration.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development. In a few, small areas it is used for woodland.

This soil is well suited to corn, soybeans (fig. 11), small grain, and most specialty crops. Wetness is a limitation. Another limitation is the moderately slowly permeable and slowly permeable fragipan. During periods when rainfall is below normal or poorly distributed, drought can damage crops. Existing, well maintained, drainage systems help to overcome wetness. Leaving stubble on the surface and adding other organic material will conserve moisture. Crop residue management, cover crops, and green manure

Figure 11.—No-till corn planted in soybean residue left on the surface during the previous year. The soil is Clarksburg silt loam, 0 to 3 percent slopes.

crops help to maintain the organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Wetness and moderately slow and slow permeability are severe limitations for onsite waste disposal. Wetness and shrinking and swelling are moderate limitations for dwellings without basements. Wetness is a severe limitation for dwellings with basements and most other urban uses. Wetness and low strength are moderate limitations for local roads and streets.

The land capability classification is 2W. The woodland ordination symbol is 4A.

CkB—Clarksburg silt loam, 3 to 8 percent slopes

This is a gently sloping, very deep, moderately well drained soil on broad uplands and in depressions. Slopes are smooth and convex. Areas of this soil are oval or long and narrow in shape and range from 5 to 25 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 8 inches thick. The subsoil is about 46 inches thick. It is yellowish brown, friable silt loam to a depth of 16 inches; yellowish brown, mottled, friable and firm silt loam to a depth of 32 inches; yellowish brown, mottled, firm and brittle silty clay loam to a depth of 40 inches; and brown and yellowish brown, mottled, firm and brittle clay loam to a depth of 54 inches. The substratum to a depth of 60 inches is yellowish brown, mottled, friable very channery clay loam. In some areas the soil is nearly level or does not have a fragipan. In some areas the solum is loam less than 20 inches thick or depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, small areas of very deep, well drained Conestoga, Duffield, and Hagerstown soils on broad ridgetops. These soils do not have a fragipan. Hagerstown soils have more clay than the Clarksburg soil. Also included are areas where a few, large sandstone, schist, and other crystalline rock fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability of this Clarksburg soil is moderate above the fragipan and slow or moderately slow in the fragipan and the substratum. Available water capacity is moderate or high. Surface runoff is medium. The fragipan is at a depth of 20 to 36 inches. The seasonal high water table is at a depth of 18 to 36 inches. In

unlimed areas this soil is strongly acid to slightly acid. The fragipan and the seasonal high water table restrict root penetration.

In most areas this soil is used for cropland and pasture. In some areas it is used for woodland or urban development.

It is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the major hazard; wetness is the main limitation. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, and grassed waterways. Existing, well maintained drainage systems help to overcome wetness. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Wetness and moderately slow and slow permeability are severe limitations for onsite waste disposal. Wetness and shrinking and swelling are moderate limitations for dwellings without basements. Wetness is a severe limitation for dwellings with basements and most other urban uses. Wetness and low strength are moderate limitations for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

Cm—Codorus silt loam

This is a nearly level, very deep, moderately well drained soil on flood plains. Slopes are smooth and range from 0 to 3 percent. Areas of this soil are long and narrow in shape and range from 5 to 300 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 8 inches thick. The subsoil is about 40 inches thick. It is brown, friable silt loam to a depth of 12 inches; dark yellowish brown, mottled, friable silt loam to a depth of 20 inches; and brown and yellowish brown, mottled, friable silt loam to a depth of 48 inches. The substratum extends to a depth of 60 inches. In the upper part it is stratified olive brown and dark grayish brown, mottled, friable silt loam. In the lower part it is dark grayish brown, mottled, friable silt loam. In some areas the soil is brown or yellowish brown to a depth of 60 inches or more or has more sand. In some areas it is stratified clay, sand, and gravel.

Included with this soil in mapping are a few, small areas of Baile, Chagrin, Glenville, and Hatboro soils. Poorly drained Baile and Hatboro soils are grayish throughout. Baile soils are in depressions and drainageways on lowlands. The well drained Chagrin soils are brown throughout. The moderately well drained Glenville soils are on broad lowlands on uplands and along drainageways. Glenville soils have a fragipan. Also included are some areas of soils that are higher than the Codorus soil and that are subject to rare flooding. Included soils make up about 15 percent of the map unit.

Permeability of this Codorus soil is moderate in the subsoil and moderately rapid or rapid in the substratum. Available water capacity is moderate or high. Surface runoff is slow. This soil is subject to frequent flooding for very brief periods, mainly in late winter and early spring. The seasonal high water table is at a depth of 18 to 36 inches. In unlimed areas this soil is very strongly acid to moderately acid in the upper part of the solum and strongly acid to slightly acid in the lower part of the solum and in the substratum.

In most areas this soil is used for cropland and pasture. In some small areas it is used for woodland or idle land.

It is well suited to corn and soybeans. It is not as well suited to small grain, however, because floodwater causes severe crop damage. Frequent flooding is the main hazard; wetness is the main limitation. Existing, well maintained dikes, levees, and drainage systems help to overcome flooding and wetness. Crop residue management, cover crops, and green manure crops help to maintain the organic matter content and to improve soil tilth.

This soil is suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species,

pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. Use of planting or logging equipment is limited during wet periods. Machine planting is practical in large areas.

This soil is unsuited to use as sites for onsite waste disposal and dwellings because flooding is a severe limitation. Flooding and frost action are severe limitations for local roads and streets.

The land capability classification is 2W. The woodland ordination symbol is 5W.

CnA—Conestoga silt loam, 0 to 3 percent slopes

This is a nearly level, very deep, well drained soil on broad uplands. Slopes are smooth. Areas of this soil are irregular or long and narrow in shape and range from 5 to 75 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 9 inches thick. The subsoil is about 31 inches thick. It is brown, friable silt loam to a depth of 17 inches; yellowish brown, friable silty clay loam to a depth of 24 inches; and brown, friable silty clay loam to a depth of 40 inches. The substratum extends to a depth of 60 inches. In the upper part it is variegated yellowish brown, strong brown, and dark yellowish brown, friable silt loam. In the lower part it is variegated brown and strong brown, friable loam. In some areas the soil is gently sloping. In some areas the subsoil is strong brown or reddish yellow or the substratum is dark brown or dark yellowish brown. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, small, scattered areas of moderately well drained Clarksburg soils on low rises. Also included are well drained Hagerstown soils on slightly higher rises and somewhat poorly drained Penlaw soils in depressions on lowlands. Clarksburg soils have a fragipan. Hagerstown soils have more clay in the subsoil than the Conestoga soil. Penlaw soils are grayish throughout. Included soils make up about 15 percent of the map unit.

Permeability of this Conestoga soil is moderate. Available water capacity is moderate or high. Surface runoff is slow or medium. In unlimed areas this soil is very strongly acid to neutral in the solum and moderately acid to slightly alkaline in the substratum.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development or woodland.

It is well suited to corn, soybeans, small grain, and most specialty crops. Crop residue management, cover crops, and green manure crops help to maintain the organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Moderate permeability is a moderate limitation for onsite waste disposal. The soil is suitable as sites for dwellings and most other urban uses. Frost action and low strength are moderate limitations for local roads and streets.

The land capability classification is 1. The woodland ordination symbol is 5A.

CnB—Conestoga silt loam, 3 to 8 percent slopes

This is a gently sloping, very deep, well drained soil on undulating, broad uplands. Slopes are smooth and convex. Areas of this soil are irregular in shape and range from 5 to 500 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 9 inches thick. The subsoil is about 31 inches thick. It is brown, friable silt loam to a depth of 17 inches; yellowish brown, friable silty clay loam to a depth of 24 inches; and brown, friable silty clay loam to a depth of 40 inches. The substratum extends to a depth of 60 inches. In the upper part it is variegated yellowish brown, strong brown, and dark yellowish brown friable silt loam. In the lower part it is variegated brown and strong brown, friable loam. In some areas the soil is nearly level or the subsoil is strong brown or reddish yellow. In some areas depth to bedrock is less than 60 inches. In a few areas the substratum is dark brown and dark yellowish brown.

Included with this soil in mapping are a few, small, scattered areas of moderately well drained Clarksburg soils on low rises. Also included are well drained Hagerstown soils on slightly higher rises and poorly drained Penlaw soils in depressions on lowlands. Clarksburg soils have a fragipan. Hagerstown soils have more clay in the subsoil than the Conestoga soil.

Penlaw soils are grayish throughout. Included soils make up about 15 percent of the map unit.

Permeability of this Conestoga soil is moderate. Available water capacity is moderate or high. Surface runoff is medium. In unlimed areas this soil is very strongly acid to neutral in the solum and moderately acid to slightly alkaline in the substratum.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development or woodland.

This soil is well suited to corn, soybeans, small grain, and most speciality crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas. Moderate permeability is a moderate limitation for onsite waste disposal. The soil is suitable as sites for dwellings and most other urban uses. Low strength is a severe limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 5A.

CnC—Conestoga silt loam, 8 to 15 percent slopes

This is a strongly sloping, very deep, well drained soil on undulating uplands and side slopes. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 15 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 9 inches thick. The subsoil is about 31 inches thick. It is brown friable silt loam to a depth of 17 inches; yellowish brown friable silty clay loam to a depth of 24 inches; and brown, friable silty clay loam to a depth of 40 inches. The substratum extends to a depth of 60 inches. In the upper part it is variegated yellowish brown, strong brown, and dark yellowish brown, friable silt loam and loam. In the lower part it is variegated brown and strong brown, friable loam. In some areas the soil is gently sloping and moderately steep. In a few areas the substratum is dark brown and dark yellowish brown. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, small, scattered areas of moderately well drained Clarksburg soils on low rises and well drained Hagerstown soils on slightly higher rises. Clarksburg soils have a fragipan. Hagerstown soils have more clay in the subsoil than the Conestoga soil. Also included are areas where a few, large sandstone fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability of this Conestoga soil is moderate and available water capacity is moderate or high. Surface runoff is rapid. In unlimed areas this soil is very strongly acid to neutral in the solum and moderately acid to slightly alkaline in the substratum.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development or woodland.

This soil is fairly well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No major hazards or limitations affect

use and management. Machine planting is practical in large areas.

Moderate permeability and slope are severe limitations for onsite waste disposal. Slope is a moderate limitation for dwellings and most other urban uses. Low strength is a severe limitation for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 5A.

CrA—Croton silt loam, 0 to 3 percent slopes

This is a nearly level, deep, poorly drained soil on lowlands and in depressions and drainageways. Slopes are smooth or concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 150 acres in size.

Typically, the surface layer is dark reddish brown, friable silt loam about 12 inches thick. The subsurface layer is dark reddish gray, mottled, friable silt loam about 2 inches thick. The subsoil is about 23 inches thick. It is reddish gray, mottled, firm silt loam to a depth of 20 inches; pinkish gray, mottled, very firm and brittle silt loam to a depth of 27 inches; and below that, to a depth of 37 inches, reddish brown, mottled, very firm silt loam that has lenses of gray silty clay. The substratum to a depth of 42 inches is reddish brown, mottled, firm channery silt loam. Fractured, weak red siltstone bedrock is at a depth of 42 inches. In some areas the soil is gently sloping or has more sand. In a few areas the soil does not have a fragipan. In some areas it is loam and silty clay loam. In some areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas of very deep, somewhat poorly drained Bowmansville soils and moderately well drained Rowland soils in lower, nearly level or slightly depressional areas on bottom lands. These soils have less silt than the Croton soil. Also included are a few small areas of moderately well drained Raritan soils on stream terraces. Included soils make up about 15 percent of the map unit.

Permeability of this Croton soil is moderate and moderately slow above the fragipan and slow and very slow in the fragipan and the substratum. Available water capacity is moderate or high. Surface runoff is slow to ponded. The fragipan is at a depth of 15 to 25 inches. The seasonal high water table is at a depth of 0 to 6 inches, mainly in winter and early spring. In unlimed areas the soil is very strongly acid or strongly acid in the upper part of the solum and very strongly acid to moderately acid in the lower part of the solum and in the substratum. The fragipan restricts root penetration.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development.

This soil is poorly suited to cultivated crops because of wetness. Existing, well maintained drainage systems help to overcome wetness. Cover crops and a conservation tillage system that leaves protective amounts of crop residue on the surface help to maintain the organic matter content and to improve soil tilth.

This soil is well suited to pasture. It is poorly suited to deep-rooted legumes, such as alfalfa, because of the very slow or slow permeability in the fragipan, which restricts root penetration and downward movement of water. Overgrazing or grazing when the soil is wet, however, causes surface compaction and poor tilth. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderate. The main management concerns are the equipment limitation and seedling mortality. The rooting depth is restricted by the seasonal high water and the fragipan. Equipment should be operated only when the soil is relatively dry or frozen. Using special planting stock and overstocking help to reduce seedling mortality. Machine planting is practical in large areas.

Wetness and very slow or slow permeability are moderate limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses. Wetness and frost action are severe limitations for local roads and streets.

The land capability classification is 4W. The woodland ordination symbol is 3W.

CrB—Croton silt loam, 3 to 8 percent slopes

This is a gently sloping, deep, poorly drained soil on lower slopes, in depressions, and in drainageways. Slopes are smooth and concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark reddish brown, friable silt loam about 12 inches thick. The subsurface layer is dark reddish gray, mottled, friable silt loam about 2 inches thick. The subsoil is about 23 inches thick. It is reddish gray, mottled, firm silt loam to a

depth of 20 inches; pinkish gray, mottled, very firm and brittle silt loam to a depth of 27 inches; and, below that, to a depth of 37 inches, reddish brown, mottled, very firm silt loam that has lenses of gray silty clay. The substratum to a depth of 42 inches is reddish brown, mottled, firm channery silt loam. Fractured, weak, red siltstone bedrock is at a depth of 42 inches. In some areas the soil is nearly level or loam and silty clay loam. In some areas it has more sand. In a few areas it does not have a fragipan. In some areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas of deep, moderately well drained Readington soils and moderately deep Reaville soils in slight depressions and along drainageways on lowlands. These soils have less silt than the Croton soil. Reaville soils do not have a fragipan. Also included are a few, small areas where some large sandstone fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability of this Croton soil is moderate and moderately slow above the fragipan and very slow and slow in it and in the substratum. Available water capacity is moderate or high. Surface runoff is medium. Root penetration is restricted by the fragipan at a depth of 15 to 25 inches. The seasonal high water table is within a depth of 6 inches. In unlimed areas this soil is very strongly acid to strongly acid in the upper part of the solum and very strongly acid to moderately acid in the lower part and in the substratum.

In most areas this soil is used for cropland, pasture, or woodland. In some areas it is used for urban development or woodland.

This soil is poorly suited to cultivated crops because of wetness. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, ridge tillage, contour farming, and grassed waterways. Existing, well maintained drainage systems help to lower the water table. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. It is poorly suited to deep-rooted legumes, such as alfalfa, because of the very slow or slow permeability in the fragipan, which restricts root penetration. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderate. The main management concerns are the equipment limitation and seedling mortality. The rooting depth is restricted by the seasonal high water and the fragipan. Equipment should be operated only when the soil is relatively dry or frozen. Using special planting stock and overstocking help to reduce seedling mortality. Machine planting is practical in large areas.

Wetness and very slow or slow permeability are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses. Wetness, low strength, and frost action are severe limitations for local roads and streets.

The land capability classification is 4W. The woodland ordination symbol is 3W.

DuA—Duffield silt loam, 0 to 3 percent slopes

This is a nearly level, very deep, well drained soil on broad uplands. Slopes are smooth or concave. Areas of this soil are oval or elongated in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 10 inches thick. The subsoil is about 40 inches thick. It is strong brown, friable silt loam to a depth of 16 inches and strong brown, friable silty clay loam and silt loam to a depth of 50 inches. The substratum to a depth of 60 inches is strong brown, friable channery loam. In some areas the soil is gently sloping. In some areas the subsoil is yellowish brown. In a few areas the surface layer is loam, clay loam, or silty clay loam. In other areas it is gravelly or channery. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, small areas of very deep, moderately well drained Clarksburg soils on broad depressions and on low rises. Also included are small areas of somewhat poorly drained Penlaw soils on higher lying, broader, flatter ridgetops and in the lower part of depressions. These soils have a fragipan. Included soils make up about 15 percent of the map unit.

Permeability of this Duffield soil is moderate. Available water capacity is high or very high. Surface runoff is slow or medium. In unlimed areas this soil is strongly acid to neutral in the upper part of the solum

and strongly acid to slightly acid in the lower part and in the substratum.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development or woodland.

It is well suited to corn, soybeans, small grain, and most specialty crops. A conservation tillage system that leaves protective amounts of crop residue on the surface, cover crops, and green manure crops help to maintain the organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock is a moderate limitation for onsite waste disposal. Moderate permeability is a moderate limitation for dwellings and most other urban uses. Low strength is a severe limitation for local roads and streets.

The land capability classification is 1. The woodland ordination symbol is 5A.

DuB—Duffield silt loam, 3 to 8 percent slopes

This is a gently sloping, very deep, well drained soil on broad uplands. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 200 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 10 inches thick. The subsoil is about 40 inches thick. It is strong brown, friable silt loam to a depth of 16 inches and strong brown, friable silty clay loam and silt loam to a depth of 50 inches. The substratum to a depth of 60 inches is strong brown, friable channery loam. In some areas the soil is nearly level and strongly sloping. In some areas the subsoil is reddish yellow. In a few areas the surface layer is loam, clay loam, or silty clay loam. In other areas it is gravelly and channery. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, small areas of very deep, moderately well drained Clarksburg soils in broad depressions and on low rises. Also included are small areas of somewhat poorly drained Penlaw soils on higher lying, broader, flatter ridgetops and in the lower part of depressions. Clarksburg and Penlaw soils have a fragipan. Included soils make up about 15 percent of the map unit.

Permeability of this Duffield soil is moderate. Available water capacity is high or very high. Surface runoff is medium. In unlimed areas this soil is strongly acid to neutral in the upper part of the solum and strongly acid to slightly acid in the lower part and in the substratum.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development or woodland.

It is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock is a moderate limitation for onsite waste disposal. Shrinking and swelling is a moderate limitation for dwellings and most other urban uses. Low strength is a severe limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 5A.

DuC—Duffield silt loam, 8 to 15 percent slopes

This is a strongly sloping, very deep, well drained soil on side slopes. Slopes are convex. Areas of this

soil are long and narrow in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 10 inches thick. The subsoil is about 40 inches thick. It is strong brown, friable silt loam to a depth of 16 inches and strong brown, friable silty clay loam and silt loam to a depth of 50 inches. The substratum to a depth of 60 inches is strong brown, friable channery loam. In some areas the soil is gently sloping and moderately steep. In a few areas the surface layer is silty clay loam, silty clay, clay loam, or loam. In other areas it is gravelly or channery. In some areas the solum is less than 40 inches or depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, small, scattered areas of strongly sloping Hagerstown and Murrill soils on side slopes. Hagerstown soils have less sand and more clay throughout than the Duffield soil. Also included are some small areas where a few, large rock fragments are on or below the surface. Also included are some areas where sandstone and limestone crops out. Included areas make up about 15 percent of the map unit.

Permeability of this Duffield soil is moderate. Available water capacity is high or very high. Surface runoff is rapid. In unlimed areas this soil is strongly acid to neutral in the upper part of the solum and strongly acid to slightly acid in the lower part and in the substratum.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development or woodland.

It is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to control surface runoff if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock and slope are severe limitations for onsite waste disposal. Slope and shrinking and swelling are moderate limitations for dwellings and most other urban uses. Slope and low strength are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 5A.

DWD—Duffield and Hagerstown silt loams, 15 to 25 percent slopes

This unit consists of moderately steep, very deep, well drained Duffield and Hagerstown silt loams. These soils are in areas on the edges of broad ridges and hills. They were mapped together because of their similarity in slope, use, and management. The map unit is about 45 percent Duffield soils, 40 percent Hagerstown soils, and 15 percent included soils. Slopes are smooth and convex. Areas of these soils are irregular or long and narrow in shape and range from 5 to 25 acres in size.

Typically, the Duffield soils have a surface layer of dark brown, friable silt loam about 10 inches thick. The subsoil is about 40 inches thick. It is strong brown, friable silt loam to a depth of 16 inches and strong brown, friable silty clay loam and silt loam to a depth of 50 inches. The substratum to a depth of 60 inches is strong brown, friable channery loam. In some areas the soils are strongly sloping and steep. In a few areas it is loam, clay loam, silty clay loam, or silty clay. In some areas depth to bedrock is less than 60 inches.

Typically, the Hagerstown soils have a surface layer of reddish brown, silt loam about 10 inches thick. The subsoil is 62 inches or more in thickness. It is yellowish red, friable silty clay and clay to a depth of 28 inches; yellowish red, firm clay to a depth of 42 inches; and yellowish red and strong brown, friable clay to a depth of 53 inches. It is yellowish red, friable silty clay loam to a depth of 72 inches. In some areas the soils are strongly sloping and steep or have less clay.

Included with these soils in mapping are a few, scattered areas of gently sloping Murrill soils at the base of side slopes. Also included are some areas where a few, large rock fragments are on or below the surface. Also included are a few areas where

sandstone or limestone bedrock crops out. Included areas make up about 15 percent of the map unit.

Permeability of both Duffield and Hagerstown soils is moderate or moderately rapid in the surface layer and moderate in the subsoil and the substratum. Available water capacity of both soils is high or very high. Surface runoff is rapid. In unlimed areas these soils are strongly acid to neutral in the upper part of the solum and strongly acid to slightly acid in the lower part and in the substratum.

In most areas these soils are used for pasture or woodland or are idle land. In some areas they are used for urban development.

These soils are poorly suited to cultivated crops because of slope and a severe hazard of erosion. In some years small grain is grown to reestablish stands of grasses and legumes.

These soils are well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on these soils is moderately high. Erosion hazard and equipment limitation are major management concerns. Insuring gentle grades on logging roads, skid trails, and landings helps to control erosion. Water bars, out-sloping road surfaces, culverts, and drop structures also are needed to control erosion. Ordinary crawler tractors and rubber-tired skidders cannot be operated safely on steeper slopes. When the soils are wet, logging roads become slippery and quickly rutted. Seedlings survive and grow well if competing vegetation is controlled and livestock is excluded from wooded areas. Machine planting is practical in large areas.

Slope is a severe limitation for onsite waste disposal and dwellings. Slope and low strength are moderate limitations for local roads and streets.

The land capability classification is 4E for both Duffield and Hagerstown soils. The woodland ordination symbol is 5R for the Duffield soils and 5C for the Hagerstown soils.

Dx—Dumps, refuse

This map unit consists of areas that have been cut and filled during grading for the disposal of refuse and waste from residential, commercial, and industrial sites. It is on uplands. Slopes are very complex. They are nearly level to strongly sloping and range from 0 to 15 percent. Areas of Dumps, refuse, are irregular in shape and range from 10 to 200 acres in size.

Typically, the fill and pit areas consist of a mixture of the original surface soil, subsoil, and substratum. The textures are silt loam, silty clay loam, silty clay, clay, clay loam, loam, sandy clay loam, and sandy loam. Gravel, sand, stones, or boulders are in some areas.

Included with Dumps, refuse, in mapping are a few, small areas of undisturbed soils.

On Dumps, refuse, permeability, available water capacity, runoff, reaction, and depth to bedrock are variable.

In most areas Dumps, refuse, are barren or are have sparse vegetation of grasses, shrubs, and trees. In some areas they are still active.

Dumps, refuse, comprise variable soil materials. Detailed onsite investigations are needed to determine the suitability and limitations of this map unit for any proposed use.

This map unit has been assigned neither a land capability classification nor a woodland ordination symbol.

EdB—Edgemont channery loam, 3 to 8 percent slopes

This is a gently sloping, very deep, well drained soil on broad ridgetops. Slopes are smooth or convex. Areas of this soil are irregular in shape and range from 5 to 200 acres in size.

Typically, the surface layer is very dark grayish brown, very friable channery loam about 8 inches thick. The subsoil is about 22 inches thick. It is yellowish brown, friable channery loam to a depth of 24 inches and yellowish brown, friable very channery sandy loam to a depth of 30 inches. The substratum to a depth of 60 inches is brown, friable extremely channery sandy loam. In some areas the soil is nearly level and strongly sloping or has less clay. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, scattered areas of deep Glenelg soils on side slopes. These soils are redder throughout than the Edgemont soil. Included soils make up about 10 percent of the map unit.

Permeability of this Edgemont soil is moderate or moderately rapid. Available water capacity is low or moderate. Surface runoff is medium. In unlimed areas this soil is extremely acid or strongly acid.

In most areas this soil is used for cropland, pasture,

or woodland. In some areas it used for urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard, and low or moderate available water capacity during low rainfall is a limitation. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock and moderate permeability are moderate limitations for onsite waste disposal. The soil is suitable as sites for dwellings without basements. Depth to bedrock is a moderate limitation for dwellings with basements and most other urban uses. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

EdC—Edgemont channery loam, 8 to 15 percent slopes

This is a strongly sloping, very deep, well drained soil on ridgetops and side slopes. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 200 acres in size.

Typically, the surface layer is dark grayish brown, very friable channery loam about 8 inches thick. The subsoil is about 22 inches thick. It is yellowish brown, friable channery loam to a depth of 24 inches and yellowish brown, friable very channery sandy loam to a depth of 30 inches. The substratum to a depth of 60 inches is brown, friable extremely channery sandy loam. In some areas the soil is gently sloping and moderately steep or has more clay. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, scattered areas of moderately deep, somewhat excessive drained Catoctin and Mt. Airy soils on sides of ridges and hills. These soils have more sand and rock fragments than the Edgemont soil. Also included are a few, small areas where many large boulders are on or below the surface. Also included are a few areas where sandstone or limestone bedrock crops out. Included soils make up about 15 percent of the map unit.

Permeability of this Edgemont soil is moderate or moderately rapid. Available water capacity is low or moderate. Surface runoff is rapid. In unlimed areas this soil is extremely acid or strongly acid.

In most areas this soil is used for cropland, pasture, or woodland. In some areas it is used for urban development.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Low or moderate available water capacity during low rainfall is a limitation. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock, slope, and moderate permeability are moderate limitations for onsite waste disposal. Slope is a moderate limitation for dwellings without basements. Depth to bedrock and slope are moderate

limitations for dwellings with basements and most other urban uses. Frost action and slope are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4A.

EdD—Edgemont channery loam, 15 to 25 percent slopes

This is a moderately steep, deep and very deep, well drained soil on ridges and hills. Slopes are smooth or convex. Areas of this soil are irregular and long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark grayish brown, very friable channery loam about 8 inches thick. The subsoil is about 22 inches thick. It is yellowish brown, friable channery loam to a depth of 24 inches and yellowish brown, friable very channery sandy loam to a depth of 30 inches. The substratum to a depth of 60 inches is brown, friable extremely channery sandy loam. In some areas the soil is strongly sloping and steep or has more clay. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, scattered areas of moderately deep, somewhat excessive drained Catoctin and Mt. Airy soils on sides of ridges and hills. These soils have more sand and more rock fragments than the Edgemont soil. Also included are a few, small areas where many large boulders are on or below the surface. Also included are a few areas where sandstone, schist, or phyllite bedrock crops out. Included areas make up about 15 percent of the map unit.

Permeability of this Edgemont soil is moderate or moderately rapid. Available water capacity is low or moderate. Surface runoff is rapid. In unlimed areas this soil is extremely acid or strongly acid.

In most areas this soil is used for pasture or woodland or is idle land. In a few areas it is used for cultivated crops.

This soil is fairly well suited to some specialty crops. It is poorly suited to corn, soybeans, and small grain in areas where slope is less than 18 percent. It is unsuited to cultivated crops in areas where slope is more than 18 percent. Erosion is the major hazard. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. When the soil is wet, logging roads become slippery and quickly rutted. Slope limits use of planting or logging equipment. Machine planting, however, is generally practical in large areas.

Slope is a severe limitation for onsite waste disposal, dwellings, and local roads and streets.

The land capability classification is 4E. The woodland ordination symbol is 4R.

EeB—Edgemont channery loam, 0 to 8 percent slopes, very stony

This is a nearly level and gently sloping, deep and very deep, well drained soil on ridgetops. Slopes are smooth and convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 400 acres in size. Stones and boulders that range from 1 to more than 3 feet across cover 1 to 3 percent of the surface.

Typically, the surface layer is very dark gray, very friable channery loam about 2 inches thick. The subsurface layer is brown, friable channery loam 3 inches thick. The subsoil is about 25 inches thick. It is yellowish brown, friable channery loam to a depth of 24 inches and yellowish brown, friable very channery sandy loam to a depth of 30 inches. The substratum to a depth of 60 inches is brown, friable extremely channery loam. In some areas the soil is strongly sloping and steep. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, scattered areas of moderately deep, somewhat excessive drained Catoctin and Mt. Airy soils on sides of ridges and hills. These soils have more sand and more rock fragments than the Edgemont soil. Also included are a few, small areas where many large boulders are on or below the surface. Also included are a few areas where sandstone and limestone bedrock crops out. Included soils make up about 15 percent of the map unit.

Permeability of this Edgemont soil is moderate or

moderately rapid. Available water capacity is low or moderate. Surface runoff is rapid. In unlimed areas this soil is extremely acid to strongly acid.

In most areas this soil is used for woodland. In some areas it is used for urban development.

It is unsuited to cultivated crops and poorly suited to permanent pasture because of stones and boulders on and below the surface. Potential productivity for trees on this soil is moderate. Stones and boulders restrict machine planting. Disturbing the ground cover as little as possible when harvesting trees helps to control erosion.

Depth to bedrock, stones beneath the surface, and moderate or moderately rapid permeability are moderate limitations for onsite waste disposal. The soil is suitable as sites for dwellings without basements. Depth to bedrock is a moderate limitation for dwellings without basements and most other urban uses. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 6S. The woodland ordination symbol is 4A.

EeD—Edgemont channery loam, 8 to 25 percent slopes, very stony

This is a strongly sloping and moderately steep, very deep, well drained soil on ridges and hills. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 10 to 400 acres in size. Stones and boulders that range in size from 1 to more than 3 feet in diameter cover about 1 to 3 percent of the surface.

Typically, the surface layer is very dark gray, very friable channery loam about 2 inches thick. The subsurface layer is brown channery loam about 3 inches thick. The subsoil is about 25 inches thick. It is yellowish brown, friable channery loam to a depth of 24 inches and yellowish brown, friable very channery sandy loam to a depth of 30 inches. The substratum to a depth of 60 inches is brown, very friable extremely channery sandy loam.
In some areas the soil is gently sloping and steep. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, scattered areas of moderately deep, somewhat excessive drained Catoctin and Mt. Airy soils on sides of ridges and hills. These soils contain more sand and rock fragments than the Edgemont soil. Also included are a few, small areas where many large boulders are on or below the surface. Also included are a few areas where sandstone or limestone bedrock crops out. Included soils make up about 15 percent of the map unit.

Permeability of this Edgemont soil is moderate or moderately rapid. Available water capacity is low or moderate. Surface runoff is rapid. In unlimed areas this soil is extremely acid or strongly acid.

In most areas this soil is used for woodland or is idle land. In some areas it is used for urban development.

This soil is unsuited to grasses and legumes for permanent pasture and cultivated crops because of stones and boulders on the surface. Potential productivity for trees on this soil is moderately high. The main management concern is the equipment limitation. Operating ordinary crawler tractors and rubber-tired skidders can be hazardous because of slope. Machine planting is restricted by slope and by stones and boulders. Disturbing the ground cover as little as possible when harvesting trees helps to control erosion.

Slope is a severe limitation for onsite waste disposal, dwellings, and local roads and streets.

The land capability classification is 6S. The woodland ordination symbol is 4R.

EeF—Edgemont channery loam, 25 to 70 percent slopes, very stony

This is a steep and very steep, very deep, well drained soil on ridges and hills. Slopes are smooth and convex. Areas of this soil are long and narrow in shape and range from 10 to 400 acres in size. Stones and boulders that range in size from 1 to 3 feet across cover about 1 to 3 percent of the surface.

Typically, the surface layer is very dark gray, very friable channery loam about 2 inches thick. The subsurface layer is brown, channery loam about 3 inches. The subsoil is about 25 inches thick. It is yellowish brown, friable channery loam to a depth of 24 inches and yellowish brown, friable very channery sandy loam to a depth of 30 inches. The substratum to a depth of 60 inches is brown, extremely channery sandy loam. In some areas the soil is strongly sloping and moderately steep.

Included with this soil in mapping are a few, scattered areas of moderately deep, somewhat excessive drained Catoctin and Mt. Airy soils on sides of ridges and hills. These soils contain more sand and rock fragments than the Edgemont soil. Also included are a few, small areas where many large boulders are on or below the surface. Also included are a few areas where sandstone or limestone bedrock

crops out. Included soils make up about 15 percent of the map unit.

Permeability of this Edgemont soil is moderate or moderately rapid. Available water capacity is low or moderate. Runoff is very rapid. In unlimed areas this soil is extremely acid to strongly acid.

In most areas this soil is used for woodland or is idle land. It is unsuited to permanent pasture and cultivated crops because of stones and boulders on the surface.

Potential productivity for trees on this soil is moderately high. The main management concern is the equipment limitation. A gentle grade is needed for logging roads, skid trails, and landings. Water bars, out-sloping road surfaces, culverts, and drop structures are needed to remove water. Ordinary crawler tractors and rubber-tired skidders cannot be operated safely on these slopes. Machine planting is restricted by slope and by stones and boulders.

This soil is unsuited to use as sites for onsite waste disposal, dwellings, and local roads and streets because of slope and stones and boulders beneath the surface.

The land capability classification is 7S. The woodland ordination symbol is 4R.

EkA—Elk silt loam, 0 to 3 percent slopes

This is a nearly level, very deep, well drained soil on stream terraces and benches above flood plains of large streams. Slopes are smooth. Areas of this soil are irregular or long and narrow in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 10 inches thick. The subsoil is about 38 inches thick. It is yellowish brown, friable silt loam to a depth of 24 inches; strong brown, friable silt loam to a depth of 36 inches; and yellowish brown, friable silt loam to a depth of 48 inches. The substratum to a depth of 60 inches is yellowish brown, friable gravelly silt loam. In some areas the soil is gently sloping. In some areas the solum is less than 40 inches. In a few areas the subsoil is dark reddish brown. In some areas depth to bedrock is less than 60 inches. In a few areas the surface layer is loam, gravelly loam, or gravelly silt loam.

Included with this soil in mapping are a few, small areas of Chagrin soils on narrow bottom lands along stream channels. Also included are a few, small areas of somewhat poorly drained Penlaw soils on higher lying, broad, flat ridgetops and in drainageways on lowlands. Also included are a few areas where some large rock fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability of this Elk soil is moderate. Available water capacity is high or very high. Surface runoff is slow. In unlimed areas this soil is very strongly acid to slightly acid.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development.

It is well suited to corn, soybeans, small grain, and most specialty crops. A conservation tillage system that leaves protective amounts of crop residue on the surface, crop residue management, cover crops, and green manure crops help to maintain the organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Some other suitable management practices are proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management.

Moderate permeability is a moderate limitation for onsite waste disposal. This soil is suitable as sites for dwellings and most other urban uses. Low strength is a severe limitation for local roads and streets.

The land capability classification is 1. The woodland ordination symbol is 7A.

EkB—Elk silt loam, 3 to 8 percent slopes

This is a gently sloping, very deep, moderately well drained soil on stream terraces and benches on flood plains of large streams. Slopes are smooth or convex. Areas of this soil are oval or irregular in shape and range from 5 to 300 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 10 inches thick. The subsoil is about 38 inches thick. It is yellowish brown, friable silt loam to a depth of 24 inches; strong brown, friable silt loam to a depth of 36 inches; and yellowish brown, friable silt loam to a depth of 48 inches. The substratum to a depth of 60 inches is yellowish brown, mottled, friable gravelly silt loam. In some areas the soil is strongly sloping. In some areas the solum is less than 40 inches. In a few areas the subsoil is dark reddish

brown. In some areas depth to bedrock is less than 60 inches. In a few areas the surface layer is loam, gravelly loam, or gravelly silt loam.

Included with this soil in mapping are a few, small areas of Chagrin soils on narrow bottom lands along stream channels. Also included are a few, small areas of moderately well drained Glenville soils in shallow depressions on lowlands and somewhat poorly drained Penlaw soils on higher lying, broad, flat ridgetops and in drainageways on lowlands. Glenville and Penlaw soils have gray mottles in the middle and lower parts of the subsoil. Also included are a few areas where some large rock fragments are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability of this Elk soil is moderate. Available water capacity is high or very high. Surface runoff is slow. In unlimed areas this soil is very strongly acid to slightly acid.

In most areas this soil is used for cropland and pasture. In some areas it is used for urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the major hazard. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Moderate permeability is a moderate limitation for onsite waste disposal. The soil is suitable as sites for dwellings and most other urban uses. Low strength is a severe limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 7A.

GbB—Glenelg channery silt loam, 3 to 8 percent slopes

This is a gently sloping, deep, well drained soil on ridgetops. Slopes are smooth or convex. Areas of this soil are irregular and long and narrow in shape and range from 5 to 200 acres in size.

Typically, the surface layer is dark brown, very friable channery silt loam about 8 inches thick. The subsoil is about 21 inches thick. It is reddish brown, friable channery silt loam; yellowish red, friable channery silt loam and channery silty clay loam to a depth of 25 inches; and yellowish red, friable channery loam to a depth of 29 inches. The substratum to a depth of 50 inches is variegated yellowish red, red, and light reddish brown, very micaceous, very channery loam. Weathered, fractured mica schist bedrock is at a depth of about 50 inches. In some areas the soil is nearly level and strongly sloping or has more clay throughout. In some areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small areas of very deep Edgemont soils on broader ridgetops. Edgemont soils are less red in the solum than the Glenelg soil. Also included are narrow strips of Glenville soils along drainageways at the bottom of draws. Also included are some areas of soils that are grayish in the lower part of the subsoil. Included soils make up about 15 percent of the map unit.

Permeability of this Glenelg soil is moderate. Available water capacity is moderate or high. Surface runoff is medium. In unlimed areas this soil is very strongly acid or strongly acid in the surface layer and very strongly acid to slightly acid in the subsoil and the substratum.

In most areas this soil is used for cropland and pasture. In a few areas it is used for woodland or is idle land.

It is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Moderate permeability is a moderate limitation for onsite waste disposal. The soil is suitable as sites for dwellings and most other urban uses. Low strength and frost action are moderate limitations for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

GbC—Glenelg channery silt loam, 8 to 15 percent slopes

This is a strongly sloping, deep, well drained soil on ridgetops and side slopes. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape in shape and range from 5 to 200 acres in size.

Typically, the surface layer is dark brown, very friable channery silt loam about 8 inches thick. The subsoil is about 21 inches thick. It is reddish brown, friable channery silt loam to a depth of 12 inches; yellowish red, friable channery silt loam and channery silty clay loam to a depth of 25 inches; and yellowish red, friable channery loam to a depth of 29 inches. The substratum to a depth of 50 inches is variegated yellowish red, red, and light reddish brown, very micaceous, very channery loam. Weathered, fractured mica schist bedrock is at a depth of 50 inches. In some areas the soil is gently sloping and moderately steep or has more clay. In some areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small areas of very deep Edgemont soils on broader ridgetops. Edgemont soils are less red in the solum than the Glenelg soil. Also included are narrow strips of Glenville soils along drainageways at the bottom of draws and some areas of soils that are grayish in the lower part of the subsoil. Included soils make up about 15 percent of the map unit.

Permeability of this Glenelg soil is moderate. Available water capacity is moderate or high. Surface runoff is rapid. In unlimed areas this soil is very strongly acid or strongly acid in the surface layer and very strongly acid to slightly acid in the subsoil and the substratum.

In most areas this soil is cropland or pasture. In a few areas it is used for woodland or idle land.

It is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Moderate permeability and slope are moderate limitations for onsite waste disposal. Slope is a moderate limitation for dwellings and most other urban uses. Slope, low strength, and frost action are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4A.

GbD—Glenelg channery silt loam, 15 to 25 percent slopes

This is a moderately steep, deep and very deep, well drained soil on ridges and hills. Slopes are convex. Areas of this soil are long and narrow and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, very friable channery silt loam about 8 inches thick. The subsoil is about 21 inches thick. It is reddish brown,

friable channery silt loam to a depth of 12 inches; yellowish red, friable channery silt loam and channery silty clay loam to a depth of 25 inches; and yellowish red, friable channery loam to a depth of 29 inches. The substratum to a depth of 50 inches is variegated yellowish red, red, and light reddish brown, very micaceous, very channery loam. Weathered, fractured mica schist bedrock is at a depth of 50 inches. In some areas the soil is strongly sloping and steep or has more clay. In some areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small areas of very deep Edgemont soils on broader ridgetops. Edgemont soils are less red in the solum than the Glenelg soil. Also included are narrow strips of Manor and Mt. Airy soils on ridges and hills between draws. Also included are some areas of soils that are grayish in the lower part of the subsoil and some areas of soils on slopes of 3 to 8 percent. Included soils make up about 15 percent of the map unit.

Permeability of this Glenelg soil is moderate. Available water capacity is moderate or high. Surface runoff is rapid. In unlimed areas this soil is very strongly acid or strongly acid in the surface layer and very strongly acid to slightly acid in the subsoil and the substratum.

In most areas this soil is used for pasture or woodland. In some areas it is used for cropland or idle land.

This soil is fairly well suited to specialty crops. It is poorly suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The erosion hazard and the equipment limitation are major management concerns. Thus, constructing roads on the contour reduces slope and helps to control erosion. Slope restricts use of equipment. Machine planting is practical in large areas.

Slope is a severe limitation for onsite waste disposal, dwellings, most other urban uses, and local roads and streets.

The land capability classification is 4E. The woodland ordination symbol is 4R.

GdA—Glenville silt loam, 0 to 3 percent slopes

This is a nearly level, very deep, moderately well drained soil on broad lowlands, in depressions, and in drainageways. Slopes are smooth or concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 150 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 10 inches thick. The subsoil is about 30 inches thick. It is yellowish brown, mottled, friable and firm silt loam to a depth of 19 inches; yellowish brown, mottled, very firm and brittle silt loam to a depth of 36 inches; and strong brown, mottled, friable channery loam to a depth of 39 inches. The substratum extends to a depth of 60 inches. It is strong brown, mottled, very friable channery loam in the upper part and extremely channery loam in the lower part. In some areas the soil is gently sloping or does not have a fragipan. In some areas the solum is loam and is less than 20 inches thick. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, small areas of Codorus soils and poorly drained Hatboro soils on narrow bottom lands next to stream channels. Hatboro soils are grayish throughout. Also included are a few, very small areas of well drained Elk soils at the base of side slopes and on narrow, low breaks adjacent to major streams. Also included are areas where some large rock fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability of this Glenville soil is moderate above the fragipan, slow and moderately slow in the fragipan, and moderately slow in the substratum. Available water capacity is moderate. Surface runoff is slow. The fragipan is at a depth of 19 to 36 inches. The seasonal high water table is at a depth of 18 to 36 inches. In unlimed areas this soil is very strongly acid to neutral in the solum and very strongly acid to moderately acid in the substratum. The fragipan and the seasonal high water table restrict root penetration.

In most areas this soil is used for cropland or

pasture. In some areas it is used for urban development. In a few, small areas it is used for woodland.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. The main limitations are the seasonal high water table in early spring and the moderately slow and slow permeability in the fragipan. Drought can damage crops when rainfall is below normal or poorly distributed. Existing, well maintained drainage systems help to overcome wetness. Leaving stubble on the surface and adding other organic material help to conserve moisture. Crop residue management, cover crops, and green manure crops help to maintain organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation, seedling mortality, and windthrow hazard are major management concerns. Equipment should be operated only when the soil is relatively dry or frozen. Using special planting stock and limited overstocking help to reduce seedling mortality. Harvesting without isolating the remaining trees or leaving them widely spaced helps to prevent windthrow. Machine planting is practical in large areas.

Wetness and slow and moderately slow permeability are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses. Wetness and frost action are severe limitations for local roads and streets.

The land capability classification is 2W. The woodland ordination symbol is 4W.

GdB—Glenville silt loam, 3 to 8 percent slopes

This is a gently sloping, very deep, moderately well drained soil on broad lowlands, in depressions, and in drainageways. Slopes are smooth or concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 150 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 10 inches thick. The subsoil is about 30 inches thick. It is yellowish brown, mottled, friable and firm silt loam to a depth of 19 inches; yellowish brown, mottled, very firm and brittle silt loam to a depth of 26 inches; and strong brown, mottled friable channery loam to a depth of 29 inches. The substratum extends to a depth of 60 inches. It is strong brown, mottled, very friable channery loam in the upper part and extremely channery loam in the lower part. In some areas the soil is nearly level and strongly sloping or does not have a fragipan. In a few areas the solum is loam throughout or less than 20 inches thick. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, small areas of well drained Chester, Elk, and Glenelg soils on narrow ridges and at the base of side slopes next to stream channels. Also included are a few, small areas of poorly drained Baile soils in lower, nearly level areas or slight depressions on lowlands. Except for Baile soils, these soils do not have gray mottles in the solum. Baile soils have a grayish solum. Also included are a few, very small areas of somewhat excessively drained Manor soils on higher hills. Also included are areas where some large rock fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability in this Glenville soil is moderate above the fragipan, slow or moderately slow in the fragipan, and moderately slow in the substratum. Available water capacity is moderate. Surface runoff is medium. The fragipan is at a depth of 19 to 36 inches. The seasonal high water table is at a depth of 18 to 36 inches. In unlimed areas this soil is very strongly acid to neutral in the solum and very strongly acid or moderately acid in the substratum. The fragipan and the seasonal high water table restrict root penetration.

In most areas this soil is used for cropland or pasture. In some areas it is used for woodland or urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the major hazard. The seasonal high water table and slow and moderately slow permeability in the fragipan are major limitations. Drought can damage crops when rainfall is below normal or poorly distributed. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, and grassed waterways. Existing, well maintained drainage systems help to overcome wetness. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation, seedling mortality, and windthrow hazard are major management concerns. Equipment should be operated only when the soil is relatively dry or frozen. Using special planting stock and limited overstocking help to reduce seedling mortality. Harvesting without isolating the remaining trees or leaving them widely spaced helps to prevent windthrow. Machine planting is practical in large areas.

Wetness and slow and moderately slow permeability are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses. Wetness and frost action are severe limitations for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4W.

HaA—Hagerstown silt loam, 0 to 3 percent slopes

This is a nearly level, very deep, well drained soil on broad uplands. Slopes are smooth or concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is reddish brown, friable silt loam about 10 inches thick. The subsoil is about 62 inches thick. It is yellowish red, friable silty clay and clay to a depth of 28 inches; red, firm clay to a depth of 42 inches; yellowish red and strong brown, friable clay to a depth of 53 inches; and yellowish red, friable silty clay loam to a depth of 72 inches. In some areas the soil is gently sloping or has less clay.

Included with this soil in mapping are a few, small, scattered areas of moderately well drained Clarksburg soils and well drained Conestoga and Duffield soils on slight rises at the edge of broad ridgetops. These soils are less clayey than the Hagerstown soil. Clarksburg soils have a fragipan. Also included are some areas where a few, large rock fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability in the Hagerstown soil is moderate or moderately rapid in the surface layer and moderate in the subsoil and the substratum. Available water capacity is high or very high. Surface runoff is slow. In unlimed areas this soil is very strongly acid to neutral in the upper part of the solum and strongly acid to neutral in lower part and in the substratum.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Crop residue management, cover crops, and green manure crops help to maintain the organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Conservation management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. Equipment should be operated only when the soil is dry or frozen. Machine planting is practical in large areas.

Moderate permeability is a moderate limitation for onsite waste disposal. Shrinking and swelling is a moderate limitation for dwellings and most other urban uses. Low strength is a severe limitation for local roads and streets.

The land capability classification is 1. The woodland ordination symbol is 5C.

HaB—Hagerstown silt loam, 3 to 8 percent slopes

This is a gently sloping, very deep, well drained soil on broad uplands. Slopes are smooth or concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 300 acres in size.

Typically, the surface layer is reddish brown, friable silt loam about 10 inches thick. The subsoil is about 62 inches thick. It is yellowish red, friable silty clay and clay to a depth of 28 inches; red, firm clay to a depth of 42 inches; yellowish red and strong brown, friable clay to a depth of 53 inches; and yellowish red, friable silty clay loam to a depth of 72 inches. In some areas

Figure 12.—Contour stripcropping on long slopes helps to reduce runoff and to control erosion. The soil is Hagerstown silt loam, 3 to 8 percent slopes.

the soil is nearly level and strongly sloping or has less clay.

Included with this soil in mapping are a few, small, scattered areas of moderately well drained Clarksburg soils and well drained Conestoga and Duffield soils on slight rises at the edges of broad ridgetops. These soils are less clayey than the Hagerstown soil. Clarksburg soils have a fragipan. Also included are some areas where a few, large rock fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability in this Hagerstown soil is moderate or moderately rapid in the surface layer and moderate in the subsoil and the substratum. Available water capacity is high or very high. Surface runoff is medium. In unlimed areas this soil is very strongly acid to neutral in the upper part of the solum and strongly acid to neutral in lower part and in the substratum.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping (fig. 12), and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. Equipment should be operated only when the soil is dry or frozen. Machine planting is practical in large areas.

Moderate permeability is a moderate limitation for onsite waste disposal. Shrinking and swelling is a moderate limitation for dwellings and most other urban uses. Low strength is a severe limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 5C.

HaC—Hagerstown silt loam, 8 to 15 percent slopes

This is a strongly sloping, very deep, well drained soil on side slopes of uplands. Slopes are smooth or concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 300 acres in size.

Typically, the surface layer is reddish brown, friable silt loam about 10 inches thick. The subsoil is about 62 inches thick. It is yellowish red, friable silty clay and clay to a depth of 28 inches; red, firm clay to a depth of

42 inches; yellowish red and strong brown, friable clay to a depth of 53 inches; and yellowish red, friable silty clay loam to a depth of 72 inches. In some areas the soil is gently sloping and moderately steep or has less clay.

Included with this soil in mapping are a few, small, scattered areas of Conestoga and Duffield soils on low rises at the base of side slopes. These soils are less clayey than the Hagerstown soil. Also included are some areas where a few, large rock fragments are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability in this Hagerstown soil is moderate or moderately rapid in the surface layer and moderate in the subsoil and the substratum. Available water capacity is high or very high. Surface runoff is rapid. In unlimed areas this soil is very strongly acid to neutral in the upper part of the solum and strongly acid to neutral in lower part and in the substratum.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. Equipment should be operated only when the soil is dry or frozen. Machine planting is practical in large areas.

Moderate permeability and slope are moderate limitations for onsite waste disposal. Slope and shrinking and swelling are moderate limitations for dwellings and most other urban uses. Low strength is a severe limitation for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 5C.

Hc—Hatboro silt loam

This is a nearly level, very deep, poorly drained soil on flood plains (fig. 13). Slopes are smooth and range from 0 to 3 percent. Areas of this soil are long and narrow in shape and range from 5 to 300 acres in size.

Figure 13.—An area of Hatboro silt loam. This poorly drained soil is suited to pasture. Neshaminy soils, which are in crops, are on Nells Hill in the background.

Typically, the surface layer is dark brown, mottled, friable silt loam about 6 inches thick. The subsurface layer is light brownish gray, mottled, friable silt loam 6 inches thick. The subsoil is grayish brown and light brownish gray, mottled, friable silt loam about 33 inches thick. The substratum to a depth of 60 inches is light brownish gray, mottled, friable gravelly silt loam. In some areas the stratified substratum is at a depth less than 40 inches. In some areas the surface layer is black. In a few areas the soil has more sand and less clay.

Included with this soil in mapping are a few, small, scattered areas of moderately well drained Codorus and Lindside soils on swells on bottom lands. Also included are a few, small, scattered areas of moderately well drained Glenville soils on broad lowlands above the Hatboro soil. These soils are less grayish throughout. Glenville soils have a fragipan. Also included are some small areas of Baile and Watchung soils in depressions and in drainageways on lowlands above the Hatboro soil. Also included are some areas where a few, large rock fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability of this Hatboro soil is moderate in the solum and moderately rapid in the substratum. Available water capacity is high, but rooting depth is restricted by the high water table. In most months the seasonal high water is within a depth of 0 to 6 inches. Surface runoff is slow or ponded. Frequent flooding for brief periods is a hazard mainly in winter and early spring. In unlimed areas this soil is very strongly acid to neutral in the solum and moderately acid or slightly acid in the substratum.

In most areas this soil is used for pasture or woodland or is idle land.

This soil is unsuited to small grain and fairly well suited to corn, soybeans, and most specialty crops. Flooding is the main hazard, and wetness is the main limitation. Existing, well maintained dikes and levees and drainage systems help to overcome flooding and wetness. A conservation tillage system that leaves protective amounts of crop residue on the surface, cover crops, and green manure crops help to maintain the organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. Water-tolerant species are favored in timber stands. The equipment limitation and windthrow hazard are major management concerns. The high water table restricts use of equipment to midsummer, when the soil is dry, or to midwinter, when the soil is frozen or has a protective cover of snow. Harvesting without isolating the remaining trees or leaving them widely spaced helps to overcome the windthrow hazard. Machine planting is practical in large areas.

This soil is unsuited to use as sites for onsite waste disposal and dwellings because flooding and wetness are severe limitations. Wetness and frost action are severe limitations for local roads and streets.

The land capability classification is 3W. The woodland ordination symbol is 3W.

HgB—Highfield channery silt loam, 3 to 8 percent slopes

This is a gently sloping, deep, well drained soil on ridgetops. Slopes are smooth or convex. Areas of this soil are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark brown, friable channery silt loam about 9 inches thick. The subsoil is about 29 inches thick. It is yellowish brown, friable channery silt loam to a depth of 12 inches; light olive brown, friable channery silt loam to a depth of 24 inches; and light olive brown, friable very channery silt loam to a depth of 38 inches. The substratum to a depth of 42 inches is light olive brown, firm very channery silt loam. Bedrock is at a depth of about 42 inches. In some areas the soil is nearly level and strongly sloping or has more clay. In other areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, scattered areas of somewhat excessively drained Catoctin soils on swells above the Highfield soil. Catoctin soils have less clay and more rock fragments than the Highfield soil. Also included are some small areas where a few, large rocks or boulders are on or below the surface. Included areas make up about 10 percent of the map unit.

Permeability in this Highfield soil is moderate. Available water capacity is moderate. Surface runoff is medium. In unlimed areas this soil is very strongly acid or strongly acid in the solum and strongly acid or moderately acid in the substratum.

In most areas this soil is used for orchards or woodland. In a few areas it is used for cropland or pasture or is idle land.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No major hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock and moderate permeability are moderate limitations for onsite waste disposal. The soil is suitable as sites for dwellings and most other urban uses. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

HgC—Highfield channery silt loam, 8 to 15 percent slopes

This is a strongly sloping, deep, well drained soil on ridgetops and side slopes. Slopes are smooth or convex. Areas of this soil are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark brown, friable channery silt loam about 9 inches thick. The subsoil is about 29 inches thick. It is yellowish brown, friable channery silt loam to a depth of 12 inches; light olive brown, friable channery silt loam to a depth of 24 inches; and light olive brown, friable very channery silt loam to a depth of 38 inches. The substratum to a depth of 42 inches is light olive brown, firm very channery silt loam. Bedrock is at a depth of about 42 inches. In some areas the soil is gently sloping and moderately steep or has more clay. In a few areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, scattered areas of somewhat excessively drained Catoctin soils on swells above the Highfield soil. Catoctin soils have less clay and more rock fragments than the Highfield soil. Also included are some small areas where a few, large rocks or boulders are on or below the surface. Included areas make up about 10 percent of the map unit.

Permeability of this Highfield soil is moderate. Available water capacity is moderate. Surface runoff is rapid. In unlimed areas this soil is very strongly acid or strongly acid in the solum and strongly acid or moderately acid in the substratum.

In most areas this soil is used for orchards or woodland. In a few areas it is used for cropland or pasture or is idle land.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No major hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock, moderate permeability, and slope are moderate limitations for onsite waste disposal. Slope is a moderate limitation for dwellings and most other urban uses. Slope and frost action are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4A.

HHD—Highfield and Catoctin channery silt loams, 15 to 25 percent slopes

This map unit consists of moderately steep, deep, well drained Highfield channery silt loam and moderately deep, somewhat excessively drained Catoctin channery silt loam. These soils are in areas on edges of broad ridges and hills. They were mapped together because of similarities in use, management, and slope. The map unit is about 50 percent Highfield soils, 35 percent Catoctin soils, and 15 percent included soils. Slopes are convex. Areas of these soils are irregular or long and narrow in shape and range from 5 to 50 acres in size.

Typically, the Highfield soils have a surface layer of dark brown, friable channery silt loam about 9 inches thick. The subsurface layer is yellowish brown, friable channery silt loam about 3 inches thick. The subsoil is about 26 inches thick. It is light olive brown, friable channery silt loam to a depth of 24 inches and light olive brown, friable very channery silt loam to a depth of 38 inches. The substratum to a depth of 42 inches is light olive brown, firm very channery silt loam. Bedrock is at a depth of about 42 inches. In some areas the soils are strongly sloping and steep or have more clay. In other areas depth to bedrock is less than 40 inches.

Typically, the Catoctin soils have a surface layer of dark brown, friable channery silt loam about 9 inches thick. The subsoil is yellowish brown, friable very channery silt loam about 7 inches thick. The substratum to a depth of 24 inches is brown, friable extremely channery silt loam. Bedrock is at a depth of 24 inches. In some areas the soils are strongly sloping and steep. In some areas depth to bedrock is less than 20 inches or the solum is less than 15 inches thick.

Included with these soils in mapping are some scattered areas where a few, large rocks or boulders are on or below the surface. Also included are some areas where slope is 8 to 15 percent or where sandstone, shale, or limestone bedrock is exposed in the lower part of the draws. Included areas make up about 20 percent of the map unit.

Permeability is moderate in the Highfield soils and moderately rapid in the Catoctin soils. Available water capacity is moderate in the Highfield soils and low or very low in the Catoctin soils. Surface runoff is rapid on both soils. In unlimed areas the Highfield soils are very strongly acid or strongly acid in the solum and strongly acid or moderately acid in the substratum. The Catoctin soil is strongly acid to slightly acid in the solum and moderately acid to neutral in the substratum. On the Catoctin soil depth to bedrock restricts root penetration.

In most areas these soils are used for orchards or woodland or are idle land. In some areas they are used for cropland or pasture.

These soils are fairly well suited to specialty crops. They are poorly suited to cultivated crops because of slope and a severe hazard of erosion. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

These soils are well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on the Highfield soils is moderately high. It is moderate on the Catoctin soils because of depth to bedrock. On the Highfield soils the equipment limitation is the main management concern. On the Catoctin soils erosion hazard, the equipment limitation, seedling mortality, and windthrow hazard are major management concerns. Because erosion is a hazard on the Catoctin soils, a gentle grade is needed for logging roads, skid trails, and landings and water bars, out-sloping road surfaces, culverts, and drop structures are needed to remove water. On both soils, ordinary crawler tractors and rubber-tired skidders cannot be operated safely on steeper slopes. When the soils are wet, logging roads become slippery and quickly rutted. On Catoctin soils, harvesting without isolating the remaining trees or leaving them widely spaced helps to prevent windthrow. In some areas replanting of seedlings is needed.

Depth to bedrock and slope are severe limitations for onsite waste disposal and dwellings. Slope is a severe limitation for local roads and streets.

The land capability classification is 4E for both the Highfield and Catoctin soils. The woodland ordination symbol is 4R for the Highfield soils and 3F for the Catoctin soils.

HKD—Highfield, Catoctin, and Myersville soils, 8 to 25 percent slopes, very stony

This map unit consists of strongly sloping and moderately steep, deep, well drained Highfield channery silt loam, moderately deep, somewhat excessively drained Catoctin channery silt loam, and deep, well drained Myersville silt loam. These soils are in areas on edges of broad ridges and hills. They were mapped together because of similarities in use and management and in slope. The map unit is about 45 percent Highfield soils, 30 percent Catoctin soils, and 15 percent Myersville soils. Slopes are convex. Stones that range in size from 1 to more than 3 feet across cover about 1 to 3 percent of the surface. Areas of these soils are irregular or long and narrow in shape and range from 5 to 200 acres in size.

Typically, the Highfield soils have a surface layer of dark brown, friable channery silt loam about 9 inches thick. The subsurface layer is yellowish brown, friable channery silt loam about 3 inches thick. The subsoil is about 26 inches thick. In the upper 12 inches it is light olive brown, friable channery silt loam. In the lower 14 inches it is light olive brown, friable very channery silt loam. The substratum to a depth of 42 inches is light olive brown, firm very channery silt loam. Bedrock is at a depth of about 42 inches. In some areas the soils are gently sloping and steep or have more clay. In other areas depth to bedrock is less than 40 inches.

Typically, the Catoctin soils have a surface layer of dark brown, friable channery silt loam about 9 inches thick. The subsoil is yellowish brown, friable very channery silt loam about 7 inches thick. The substratum to a depth of 24 inches is brown, friable extremely channery silt loam. Bedrock is at a depth of 24 inches. In some areas the soils are gently sloping and steep. In some areas depth to bedrock is less than 20 inches. In other areas the solum is less than 15 inches thick.

Typically, the Myersville soils have a surface layer of very dark brown, friable silt loam about 3 inches thick. The subsurface layer is brown, friable silt loam about 6 inches thick. The subsoil is about 29 inches thick. In the upper 5 inches it is yellowish red, friable silty clay loam. In the next 13 inches it is yellowish red, friable channery silty clay loam. In the lower 11 inches it is yellowish red, friable channery silt loam. The substratum to a depth of 48 inches is yellowish brown and reddish brown, friable channery loam. Highly weathered, metabasalt bedrock is at a depth of 48 inches. In some areas the soils are gently sloping and steep. In some areas depth to bedrock is less than 40 inches.

Included with these soils in mapping are some scattered areas where a few, large rocks or boulders are on or below the surface. Also included are some areas where slope is 8 to 15 percent. Also included are some areas where sandstone, shale, or limestone bedrock is exposed in the lower part of draws. Included soils make up about 10 percent of the map unit.

Permeability is moderate in the Highfield soils. It is moderate or moderately rapid in the surface layer and moderate in the subsoil and the substratum in the Myersville soils. It is moderately rapid in the Catoctin soils. Available water capacity is moderate in the Highfield and Myersville soils and low or very low in the Catoctin soils. Surface runoff is rapid on all these soils. In unlimed areas the Highfield soils are very strongly acid or strongly acid in the solum and strongly acid or moderately acid in the substratum. The Catoctin soils are strongly acid to slightly acid in the solum and moderately acid to neutral in the substratum. The Myersville soils are very strongly acid to moderately acid. On the Catoctin soils depth to bedrock restricts root penetration.

In most areas these soils are used for woodland. In a few areas they are used for urban development.

They are generally unsuited to cultivated crops and poorly suited to permanent pasture. Use of most types of farm machinery is impractical on these soils because of stones on the surface.

Potential productivity for trees on the Highfield and Myersville soils is moderately high. It is moderate on the Catoctin soils because of depth to bedrock. On the Highfield soils the equipment limitation is the main management concern. On the Catoctin soils erosion hazard, equipment limitation, seedling mortality, and windthrow hazard are major management concerns. On the Myersville soils erosion hazard, equipment limitation, and plant competition are major management concerns. Because erosion is a hazard, a gentle grade is needed for logging roads, skid trails, and landings, and water bars, out-sloping road surfaces, culverts, and drop structures are needed to remove water. Ordinary crawler tractors and rubber-tired skidders cannot be operated safely on steeper slopes. When the soil is wet, logging roads become slippery and quickly rutted. Harvesting without isolating the remaining trees or leaving them widely spaced helps to

prevent windthrow. In some areas replanting of seedlings is needed.

Depth to bedrock and slope are severe limitations for onsite waste disposal and dwellings. Slope is a severe limitation for local roads and streets.

The land capability classification is 6S for the Highfield and Myersville soils and 7S for the Catoctin soils. The woodland ordination symbol is 4R for the Highfield soils, 6X for the Catoctin soils, and 5X for the Myersville soils.

KnD—Klinesville channery silt loam, 15 to 25 percent slopes

This is a moderately steep, shallow, somewhat excessively drained soil on ridges and hills. Slopes are convex. Areas of this soil are long and narrow in shape and range from 5 to 50 acres in size.

Typically, the surface layer is reddish brown, very friable channery silt loam about 8 inches thick. The subsoil is red, friable very channery silt loam about 6 inches thick. The substratum to a depth of 16 inches is dark red, firm extremely channery silt loam. Fractured, weak red shale bedrock is at a depth of about 16 inches. In some areas the soil is strongly sloping and steep. In some areas the solum is less than 10 inches. In some areas depth to bedrock is less than 10 inches.

Included with this soil in mapping are a few, scattered areas of somewhat poorly drained Lehigh soils on broad ridgetops and a few areas of moderately well drained Reaville soils on knolls and sides of draws below the Klinesville soil. These soils are less loamy throughout than the Klinesville soil. Also included are a few, small areas of moderately deep Steinsburg soils on sides of ridges above the Klinesville soil. Also included are areas where a few, large rock fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability of this Klinesville soil is moderately rapid. Available water capacity is very low. Surface runoff is rapid. In unlimed areas this soil is very strongly acid or moderately acid. Depth to bedrock restricts root penetration.

In most areas this soil is used for pasture. In some areas it is used for woodland or is idle land.

This soil is unsuited to cultivated crops and poorly suited to hay crops because of slope, shallow depth to bedrock, and very low available water capacity.

This soil is fairly well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation and seedling mortality are major management concerns. When the soil is wet, logging roads become slippery and quickly rutted. Use of planting or logging equipment is limited during wet periods. Thinning or removing undesirable species are suitable management practices. Seedlings can survive and grow well if competing vegetation is controlled and livestock is excluded from wooded areas. Machine planting is generally practical in large areas.

Depth to bedrock and slope are severe limitations for onsite waste disposal and for dwellings. Slope is a severe limitation for local roads and streets.

The land capability classification is 6E. The woodland ordination symbol is 3D.

KnE—Klinesville channery silt loam, 25 to 40 percent slopes

This is a steep, shallow, somewhat excessively drained soil on ridges and hills. Slopes are convex. Areas of this soil are long and narrow in shape and range from 5 to 50 acres in size.

Typically, the surface layer is reddish brown, very friable channery silt loam about 8 inches thick. The subsoil is red, friable very channery silt loam about 6 inches thick. The substratum to a depth of 16 inches is dark red, firm extremely channery silt loam. Fractured, weak red shale bedrock is at a depth of about 16 inches. In some areas the soil is strongly sloping and very steep. In some areas the solum is less than 10 inches thick. In some areas depth to bedrock is less than 10 inches.

Included with this soil in mapping are a few, scattered areas of well drained Brecknock and Penn soils on broad ridgetops and side slopes above the Klinesville soil. These soils are less loamy throughout than the Klinesville soil. Also included are a few, small areas of moderately deep Steinsburg soils on sides of ridges above the Klinesville soil. Also included are areas where a few, large rock fragments are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability in this Klinesville soil is moderately rapid. Available water capacity is very low. Surface runoff is rapid or very rapid. In unlimed areas this soil is very strongly acid or moderately acid. Depth to bedrock restricts root penetration.

In most areas this soil is used for woodland or pasture. In some areas it is used for idle land.

This soil is unsuited to cultivated crops and hay crops and poorly suited to grasses and legumes for permanent pasture because of slope, shallow depth to bedrock, and low available water capacity. Machinery operable on steep and very steep slopes is needed for seedbed preparation. Permanent stands of grasses and legumes help to reduce surface runoff and to control erosion. Overgrazing or tramping by livestock when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction and poor tilth. Proper seeding rates, pasture rotation, timely grazing, and restricted use during wet periods help to keep pasture and the soil in good condition.

Potential productivity for trees on this soil is moderately high. The equipment limitation and seedling mortality are major management concerns. When the soil is wet, logging roads become slippery and quickly rutted. Use of planting or logging equipment is limited during wet periods. Thinning or removing undesirable species helps to reduce seedling mortality. Seedlings can survive and grow well if competing vegetation is controlled and livestock is excluded from wooded areas. Machine planting is generally practical in large areas.

Depth to bedrock and slope are severe limitations for onsite waste disposal and for dwellings. Slope is a severe limitation for local roads and streets.

The land capability classification is 7E. The woodland ordination symbol is 3D.

Lc—Lamington silt loam

This is a nearly level, very deep, poorly drained soil on benches, on lowlands, and in depressions above flood plains of large streams. Slopes are smooth or concave and range from 0 to 3 percent. Areas of this soil are oval, irregular, or long and narrow in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 8 inches thick. The subsurface layer is reddish brown gray, mottled, friable silt loam 3 inches thick. The subsoil is about 35 inches thick. It is pinkish gray, mottled, firm silty clay loam to a depth of 17 inches; reddish gray, mottled, very firm and brittle clay loam to a depth of 32 inches; and pinkish gray, mottled, firm cobbly loam to a depth of 46 inches. The substratum to a depth of 60 inches is stratified sand and gravel. In some areas the soil is gently sloping or has more sand and gravel throughout. In some areas it has a high base saturation or does not have a fragipan. In some areas the upper part of the subsoil is brown or the solum is less than 40 inches thick.

Included with this soil in mapping are a few, small, scattered areas of well drained Birdsboro soils and moderately well drained Raritan soils on narrow ridgetops above the Lamington soil. Also included are a few, small areas of somewhat poorly drained Bowmansville soils and moderately well drained Rowland soils on narrow bottom lands. Included soils make up about 15 percent of the map unit.

Permeability in this Lamington soil is moderate in the solum above the fragipan, slow in the fragipan, and moderate or rapid in the substratum. Available water capacity is high, but rooting depth is restricted by the high water table and the fragipan. In most months the seasonal high water table is within a depth of 6 inches. Surface runoff is slow or ponded. In unlimed areas this soil is very strongly acid or strongly acid.

In most areas this soil is used for cropland, pasture, or woodland.

This soil is unsuited to small grain and poorly suited to corn, soybeans, and most specialty crops because of wetness and ponding. Existing, well maintained drainage systems help to overcome wetness. A system of conservation tillage that leaves protective amounts of crop residue on the surface, cover crops, and green manure crops help to maintain organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. Water-tolerant species are favored in timber stands. The equipment limitation, seedling mortality, and windthrow hazard are major management concerns. The high water table restricts use of equipment to midsummer, when the soil is dry, or to midwinter, when the soil is frozen or has a protective cover of snow. Special site preparation, such as bedding before planting, helps to reduce the seedling mortality rate. Harvesting without isolating the remaining trees or leaving them widely spaced helps to prevent windthrow. Seedlings survive and grow well if competing vegetation is controlled, especially during the first few years, and if livestock is excluded from wooded areas. Machine planting is practical in large areas.

This soil is unsuited to use as sites for onsite waste disposal and dwellings because of wetness and slow permeability. Wetness and frost action are severe limitations for local roads and streets.

The land capability classification is 4W. The woodland ordination symbol is 4W.

LeB—Lansdale loam, 3 to 8 percent slopes

This is a gently sloping, deep, well drained soil on broad, undulating uplands and ridgetops of dissected uplands. Slopes are smooth or convex. Areas of this soil are irregular and long and narrow in shape and range from 5 to 300 acres in size.

Typically, the surface layer is dark brown, friable loam about 10 inches thick. The subsoil is about 20 inches thick. It is dark yellowish brown, friable loam to a depth of 17 inches and yellowish brown, friable and very friable sandy loam to a depth of 30 inches. The substratum to a depth of 47 inches is yellowish brown, very friable loamy sand and loose channery loamy sand. Fractured, dark grayish brown sandstone is at a depth of about 47 inches. In some areas the soil is nearly level and strongly sloping. In some areas the lower part of the subsoil is dusky red. In a few areas the surface layer is silt loam.

Included with this soil in mapping are a few, scattered areas of Penn soils on broad ridgetops above the Lansdale soil. Penn soils have a redder solum than the Lansdale soil. Also included are some small areas of extremely channery, somewhat excessively drained Steinsburg soils. Included soils make up about 10 percent of the map unit.

Permeability in this Lansdale soil is moderate in the surface layer, moderate or moderately rapid in the subsoil, and moderately rapid in the substratum. Available water capacity is low or moderate. Surface runoff is medium. In unlimed areas this soil is very strongly acid throughout.

In most areas this soil is used for cropland or pasture. In some areas it is used for orchards or woodland. In a few areas it is used for urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock is a moderate limitation for onsite waste disposal. The soil is suitable as sites for dwellings. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

LfC—Lansdale channery loam, 8 to 15 percent slopes

This is a moderately sloping, deep, well drained soil on ridgetops and side slopes of dissected uplands. Slopes are smooth or convex. Areas of this soil are irregular and long and narrow in shape and range from 5 to 200 acres in size.

Typically, the surface layer is dark brown, friable channery loam about 10 inches thick. The subsoil is about 20 inches thick. It is dark yellowish brown, friable loam to a depth of 17 inches and yellowish brown, friable and very friable sandy loam to a depth of 30 inches. The substratum to a depth of 47 inches is yellowish brown, very friable loamy sand and loose channery loamy sand. Fractured, dark grayish brown sandstone is at a depth of about 47 inches. In some areas the soil is gently sloping and moderately steep. In some areas the lower part of the subsoil is dusky red. In a few areas the surface layer is silt loam.

Included with this soil in mapping are a few, scattered areas of Penn soils on broad ridgetops above the Lansdale soil. They have a redder solum. Also included are some small areas of extremely channery, somewhat excessively drained Steinsburg soils. Included soils make up about 10 percent of the map unit.

Permeability in this Lansdale soil is moderate in the

surface layer, moderate or moderately rapid in the subsoil, and moderately rapid in the substratum. Available water capacity is low or moderate. Surface runoff is rapid. In unlimed areas this soil is very strongly acid throughout.

In most areas this soil is used for cropland or pasture. In some areas it is used for orchards or woodland. In a few areas it is used for urban development.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices that help to control erosion and surface runoff are needed if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards and limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock is a moderate limitation for onsite waste disposal. This soil is suitable as sites for dwellings. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4A.

LgB—Legore channery silt loam, 3 to 8 percent slopes

This is a gently sloping, very deep, well drained soil on ridgetops. Slopes are smooth or convex. Areas of this soil are irregular and long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark yellowish brown, very friable channery silt loam about 8 inches thick. The subsurface layer is brown, friable silt loam about 2 inches thick. The subsoil is about 20 inches thick. It is yellowish red, friable silty clay loam to a depth of 21 inches and strong brown and yellowish red, firm silty clay loam to a depth of 30 inches. The substratum to a depth of 60 inches is strong brown, firm loam and sandy loam. In some areas the soil is nearly level and strongly sloping, has less silt and clay, or has more sand.

Included with this soil in mapping are a few, scattered areas of nearly level, somewhat poorly drained Mount Lucas soils on low rises below the Legore soil. Mount Lucas soils have gray mottles in the middle and lower parts of the subsoil. Also included are some areas where a few, large rock fragments are on or below the surface. Also included are a few, small areas where limestone bedrock crops out. Included areas make up about 10 percent of the map unit.

Permeability in this Legore soil is moderate or moderately rapid in the surface layer, moderate in the subsoil, and moderate or moderately rapid in the substratum. Available water capacity is moderate. Surface runoff is medium. In unlimed areas this soil is strongly acid to slightly acid in the upper part of the solum and moderately acid or slightly acid in the substratum.

In most areas this soil is used for cropland or pasture. In some areas it is used for orchards or woodland or is idle land. In a few areas it is used for urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use

and management. Machine planting is practical in large areas.

Moderate or moderately rapid permeability are moderate limitations for onsite waste disposal. The soil is suitable as sites for dwellings. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

LgC—Legore channery silt loam, 8 to 15 percent slopes

This is a strongly sloping, very deep, well drained soil on ridgetops and side slopes. Slopes are convex. Areas of this soil are irregular and long and narrow in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark yellowish brown, very friable channery silt loam about 8 inches thick. The subsurface layer is brown, friable silt loam about 2 inches thick. The subsoil is about 20 inches thick. It is yellowish red, friable silty clay loam to a depth of 21 inches and strong brown and yellowish red, firm silty clay loam to a depth of 30 inches. The substratum to a depth of 60 inches is strong brown, firm loam and sandy loam. In some areas the soil is gently sloping and moderately steep, has less silt and clay, or has more sand.

Included with this soil in mapping are a few, scattered areas of nearly level, somewhat poorly drained Mount Lucas soils on low rises below the Legore soil. Mount Lucas soils have gray mottles in the middle and lower parts of the subsoil. Also included are some areas where a few, large rock fragments are on or below the surface. Also included are a few, small areas where limestone bedrock crops out. Included soils make up about 10 percent of the map unit.

Permeability in this Legore soil is moderate or moderately rapid in the surface layer, moderate in the subsoil, and moderate or moderately rapid in the substratum. Available water capacity is moderate. Surface runoff is rapid. In unlimed areas this soil is strongly acid to slightly acid in the upper part of the solum and moderately acid or slightly acid in the substratum.

In most areas this soil is used for cropland or pasture. In some areas it is used for orchards or woodland or is idle land. In a few areas it is used for urban development.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and excessive surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Slope and moderate or moderately rapid permeability are moderate limitations for onsite waste disposal. The soil is suitable as sites for dwellings. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4A.

LgD—Legore channery silt loam, 15 to 25 percent slopes

This is a moderately steep, very deep, well drained soil on ridges and hills. Slopes are convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 25 acres in size.

Typically, the surface layer is dark yellowish brown, very friable channery silt loam about 8 inches thick. The subsurface layer is brown, friable silt loam about 2 inches thick. The subsoil is about 20 inches thick. It is yellowish red, friable silty clay loam to a depth of 21 inches and strong brown and yellowish red, firm silty clay loam to a depth of 30 inches. The substratum to a depth of 60 inches is strong brown, firm loam and sandy loam. In some areas the soil is strongly sloping and steep, has less silt and clay, or has more sand.

Included with this soil in mapping are some areas where a few, large rock fragments are on or below the surface. Also included are a few, small areas where limestone bedrock crops out. Included soils make up about 10 percent of the map unit.

Permeability in this Legore soil is moderate or moderately rapid in the surface layer, moderate in the subsoil, and moderate or moderately rapid in the

substratum. Available water capacity is moderate. Surface runoff is rapid. In unlimed areas this soil is strongly acid to slightly acid in the upper part of the solum and moderately acid or slightly acid in the substratum.

In most areas this soil is used for pasture or woodland or is idle land. In some areas it is used for orchards or cropland.

This soil is fairly well suited to most specialty crops. It is poorly suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. Thinning or removing undesirable species and constructing roads on the contour to reduce slope are suitable management practices. Ordinary crawler tractors and rubber-tired skidders cannot be operated safely on these slopes. Machine planting is practical in large areas.

Slope is a severe limitation for onsite waste disposal, dwellings, and local road and streets.

The land capability classification is 4E. The woodland ordination symbol is 4R.

LhA—Lehigh channery silt loam, 0 to 3 percent slopes

This is a nearly level, deep, somewhat poorly drained soil on broad ridgetops and depressions. Slopes are smooth or concave. Areas of this soil are oval or long and narrow in shape and range from 5 to 50 acres in size.

Typically, the surface layer is very dark grayish brown, friable channery silt loam about 8 inches thick. The subsoil is about 22 inches thick. It is dark grayish brown, mottled, friable channery silt loam to a depth of 14 inches; dark grayish brown, firm silty clay loam to a depth of 21 inches; and dark gray, mottled, firm channery silt loam to a depth of 30 inches. The substratum to a depth of 42 inches is dark gray and very dark gray, mottled, firm extremely channery silt loam. The very dark gray porcelanite bedrock is at a depth of 42 inches. In some areas the soil is gently sloping. In some areas the solum is less than 20 inches thick or depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas of moderately well drained Reaville soils and poorly drained Watchung soils in depressions and along drainageways on lowlands. Watchung soils have more clay throughout. Also included are some areas where a few, large rock fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability in this Lehigh soil is moderate in the surface layer and slow in the subsoil and the substratum. Available water capacity is low and surface runoff is slow. The seasonal high water table is at a depth of 6 to 18 inches. In unlimed areas this soil is very strongly acid to neutral. The seasonal high water table restricts root penetration.

In most areas this soil is used for cropland and pasture. In some areas it is used for urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. The main limitations are the seasonal high water table and depth to bedrock. During periods when rainfall is below normal or is poorly distributed, drought can damage crops. Existing, well maintained drainage systems help to overcome wetness. Leaving stubble on the surface and adding other organic material help to conserve moisture. Crop residue management, cover crops, and green manure crops help to maintain organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation, seedling

mortality, and windthrow hazard are major management concerns. Equipment should be operated only when the soil is relatively dry or frozen. Using special planting stock and limited overstocking help to reduce seedling mortality. Harvesting without isolating the remaining trees or leaving them widely spaced helps to prevent windthrow. Machine planting is practical in large areas.

Wetness and slow permeability are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses. Wetness and frost action are severe limitations for local roads and streets.

The land capability classification is 2W. The woodland ordination symbol is 4W.

LhB—Lehigh channery silt loam, 3 to 8 percent slopes

This is a gently sloping, deep, somewhat poorly drained soil on broad ridgetops. Slopes are smooth or concave. Areas of this soil are irregular and long and narrow in shape and range from 5 to 300 acres in size.

Typically, the surface layer is very dark grayish brown, friable channery silt loam about 8 inches thick. The subsoil is about 22 inches thick. It is dark grayish brown, friable channery silt loam to a depth of 14 inches; dark grayish brown, mottled firm silty clay loam to a depth of 21 inches; and dark gray, mottled, firm channery silt loam to a depth of 30 inches. The substratum to a depth of 42 inches is dark gray and very dark gray, mottled, firm extremely channery silt loam. The very dark gray porcelanite bedrock is at a depth of 42 inches. In some areas the soil is nearly level and strongly sloping. In some areas the solum is less than 20 inches thick or depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas of moderately well drained Reaville soils and poorly drained Watchung soils in depressions and along drainageways on lowlands. Watchung soils have more clay throughout. Also included are some areas where a few, large rock fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability in this Lehigh soil is moderate in the surface layer and slow in the subsoil and the substratum. Available water capacity is low and surface runoff is medium. The seasonal high water table is at a depth of 6 to 18 inches. In unlimed areas this soil is very strongly acid to neutral. The seasonal high water table restricts root penetration.

In most areas this soil is used for cropland and pasture. In some areas it is used for woodland or urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is a major hazard, and depth to bedrock and the seasonal high water table are major limitations. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Existing, well maintained drainage systems help to overcome wetness. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Some suitable management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation, seedling mortality, and windthrow hazard are major management concerns. Equipment should be operated only when the soil is relatively dry or frozen. Using special planting stock and limited overstocking help to reduce seedling mortality. Harvesting without isolating the remaining trees or leaving them widely spaced helps to prevent windthrow. Machine planting is practical in large areas.

Wetness and slow permeability are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses. Wetness and frost action are severe limitations for local roads and streets.

The land capability classification is 2W. The woodland ordination symbol is 4W.

LhC—Lehigh channery silt loam, 8 to 15 percent slopes

This is a strongly sloping, deep, somewhat poorly drained soil on ridgetops and side slopes. Slopes are smooth or convex. Areas of this soil are irregular and

long and narrow in shape and range from 5 to 200 acres in size.

Typically, the surface layer is very dark grayish brown, friable channery silt loam about 8 inches thick. The subsoil is about 22 inches thick. It is dark grayish brown, friable channery silt loam to a depth of 14 inches; dark grayish brown, mottled, firm silty clay loam to a depth of 21 inches; and dark gray, mottled, firm channery silt loam to a depth of 30 inches. The substratum to a depth of 42 inches is dark gray and very dark gray, mottled, firm extremely channery silt loam. The very dark gray porcelanite bedrock is at a depth of 42 inches. In some areas the soil is gently sloping and moderately steep. In some areas the solum is less than 20 inches thick or depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas of well drained Brecknock soils on sides of ridges and hills above the Lehigh soil. Also included are poorly drained Watchung soils in depressions and along drainageways on lowlands. Watchung soils have more clay throughout. Also included are some areas where a few, large rock fragments are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability in this Lehigh soil is moderate in the surface layer and slow in the subsoil and the substratum. Available water capacity is low and surface runoff is rapid. The seasonal high water table is at a depth of 6 to 18 inches. In unlimed areas this soil is very strongly acid to neutral. The seasonal high water table restricts root penetration.

In most areas this soil is used for cropland and pasture. In some areas it is used for orchards or woodland or is idle land. In a few areas it is used for urban development.

This soil is well suited to most specialty crops. It is fairly suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping (fig. 14), and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation, seedling mortality, and windthrow hazard are major management concerns. Equipment should be operated only when the soil is relatively dry or frozen. Using special planting stock and limited overstocking help to reduce seedling mortality. Harvesting without isolating the remaining trees or leaving them widely spaced helps to prevent windthrow. Machine planting is practical in large areas.

Wetness and slow permeability are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses. Wetness and frost action are severe limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4W.

LhD—Lehigh channery silt loam, 15 to 25 percent slopes

This is a moderately steep, deep, somewhat poorly drained soil on ridges and hills. Slopes are smooth or convex. Areas of this soil are irregular and long and narrow in shape and range from 5 to 200 acres in size.

Typically, the surface layer is very dark grayish brown, friable channery silt loam about 8 inches thick. The subsoil is about 22 inches thick. It is dark grayish brown, friable channery silt loam to a depth of 14 inches; dark grayish brown, mottled, firm silty clay loam to a depth of 21 inches; and dark gray, mottled, firm channery silt loam to a depth of 30 inches. The substratum to a depth of 42 inches is dark gray and very dark gray, mottled, firm extremely channery silt loam. The very dark gray porcelanite bedrock is at a depth of 42 inches. In some areas the soil is strongly sloping and steep. In some areas the solum is less than 20 inches thick or depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas of well drained Brecknock soils and somewhat excessively drained Klinesville soils on sides of ridges and hills above the Lehigh soil. Also included are a few, small, scattered areas of poorly drained Watchung soils in depressions and along drainageways on lowlands. Watchung soils have more clay throughout. Also included are some areas where a few, large rock fragments are on or below the surface.

Figure 14.—Contour stripping helps to reduce runoff and to control erosion. The soil is Lehigh channery silt loam, 8 to 15 percent slopes.

Included soils make up about 15 percent of the map unit.

Permeability in this Lehigh soil is moderate in the surface layer and slow in the subsoil and the substratum. Available water capacity is low and surface runoff is rapid. The seasonal high water table is at a depth of 6 to 18 inches. In unlimed areas this soil is very strongly acid to neutral. The seasonal high water table restricts root penetration.

In most areas this soil is used for pasture or woodland or is idle land. In some areas it is used for urban development.

This soil is fairly well suited to most specialty crops. It is poorly suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation, seedling mortality, and windthrow hazard are major management concerns. Equipment should be operated only when the soil is relatively dry or frozen. Using special planting stock and limited overstocking help to reduce seedling mortality. Harvesting without isolating the remaining trees or leaving them widely spaced helps to prevent windthrow. Machine planting is practical in large areas.

Wetness, slow permeability, and slope are severe limitations for onsite waste disposal. Wetness and slope are severely limited for dwellings and most other urban uses. Wetness, slope, and frost action are severe limitations for local roads and streets.

The land capability classification is 4E. The woodland ordination symbol is 4W.

LkB—Lehigh channery silt loam, 0 to 8 percent slopes, very stony

This is a nearly level and gently sloping, deep, somewhat poorly drained soil on ridgetops and in depressions. Slopes are smooth, concave, or convex. Areas of this soil are irregular and long and narrow in

shape and range from 5 to 100 acres in size. Stones and boulders that range in size from 1 to more that 3 feet across cover about 1 to 3 percent of the surface.

Typically, the surface layer is very dark grayish brown, friable channery silt loam about 2 inches thick. The subsurface layer is dark grayish brown, friable channery silt loam about 6 inches thick. The subsoil is about 22 inches thick. It is dark grayish brown, friable channery silt loam to a depth of 14 inches; dark grayish brown, mottled, firm silty clay loam to a depth of 21 inches; and dark gray, mottled, firm channery silt loam to a depth of 30 inches. The substratum to a depth of 42 inches is dark gray and very dark gray, mottled, firm extremely channery silt loam. The very dark gray porcelanite bedrock is at a depth of 42 inches. In some areas the soil is strongly sloping. In some areas the solum is less than 20 inches thick or depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas of moderately well drained Reaville soils and poorly drained Watchung soils in depressions and along drainageways on lowlands. Watchung soils have more clay throughout. Also included are some areas where a few, large rock fragments are on or below the surface. Included soils make up about 10 percent of the map unit.

Permeability in this Lehigh soil is moderate in the surface layer and slow in the subsoil and the substratum. Available water capacity is low and surface runoff is medium. The seasonal high water table is at a depth of 6 to 18 inches. In unlimed areas this soil is very strongly acid to neutral. The seasonal high water table restricts root penetration.

In most areas this soil is used for woodland or idle land.

This soil is unsuited to cultivated crops and poorly suited to permanent pasture because of slope and stones and boulders on the surface.

Potential productivity for trees on this soil is moderately high. The equipment limitation, seedling mortality, and windthrow hazard are major management concerns. Equipment should be operated only when the soil is relatively dry or frozen. Using special planting stock and limited overstocking help to reduce seedling mortality. Harvesting without isolating the remaining trees or leaving them widely spaced helps to prevent windthrow. Machine planting is practical in large areas.

Wetness, slow permeability, and stones and boulders beneath the surface are severe limitations for onsite waste disposal. Wetness and stones and boulders beneath the surface are severe limitations for dwellings and most other urban uses. Wetness, large stones and boulders, and frost action are severe limitations for local roads and streets.

The land capability classification is 7S. The woodland ordination symbol is 4W.

LrB—Lewisberry gravelly sandy loam, 3 to 8 percent slopes

This is a gently sloping, very deep, well drained soil on ridgetops. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark reddish brown, very friable gravelly sandy loam about 3 inches thick. The subsurface layer is reddish brown, very friable gravelly sandy loam about 9 inches thick. The subsoil is about 34 inches thick. It is reddish brown, friable gravelly sandy loam to a depth of 18 inches; reddish brown, firm gravelly sandy loam to a depth of 35 inches; and reddish brown, firm very gravelly sandy loam to a depth of 46 inches. The substratum to a depth of 62 inches is weak red, friable extremely gravelly sandy loam. The dusky red conglomerate bedrock is at a depth of about 62 inches. In some areas the soil is nearly level and strongly sloping. In some areas depth to bedrock is less than 60 inches or the solum is less than 40 inches thick. In a few areas the surface layer is loam or silt loam, or it is channery.

Included with this soil in mapping are a few, small, scattered areas of Arendtsville soils on sides of narrow ridges and deep Penn soils on broad, undulating ridgetops on uplands. These soils have fewer rock fragments and less sand throughout than the Lewisberry soil. Also included are a few, small areas of moderately deep Steinsburg soils around edges of ridges. Included soils make up about 15 percent of the map unit.

Permeability in this Lewisberry soil is moderately rapid. Available water capacity is low or moderate. Surface runoff is medium. In unlimed areas this soil is very strongly acid to moderately acid.

In most areas this soil is used for cropland and pasture. In some areas it is used for urban development or woodland.

It is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions,

contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

This soil is suitable as sites for onsite waste disposal, dwellings, and most other urban uses. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 2S. The woodland ordination symbol is 4A.

LrC—Lewisberry gravelly sandy loam, 8 to 15 percent slopes

This is a strongly sloping, very deep, well drained soil on ridgetops and side slopes. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark reddish brown, very friable gravelly sandy loam about 3 inches thick. The subsurface layer is reddish brown, very friable gravelly sandy loam about 9 inches thick. The subsoil is about 34 inches thick. It is reddish brown, friable gravelly sandy loam to a depth of 18 inches; reddish brown, firm gravelly sandy loam to a depth of 35 inches; and reddish brown, firm very gravelly sandy loam to a depth of 46 inches. The substratum to a depth of 62 inches is weak red, friable extremely gravelly sandy loam. The dusky red conglomerate bedrock is at a depth of about 62 inches. In some areas the soil is gently sloping and moderately steep or depth to bedrock is less than 60 inches. In some areas the solum is less than 40 inches thick. In some areas the surface layer is loam and silt loam or it is channery.

Included with this soil in mapping are a few, small, scattered areas of Arendtsville soils on sides of narrow ridges and deep Penn soils on broad, undulating ridgetops on uplands. These soils have fewer rock fragments and less sand throughout than the Lewisberry soil. Also included are a few, small areas of moderately deep Steinsburg soils around edges of ridges. Included soils make up about 15 percent of the map unit.

Permeability in this Lewisberry soil is moderately rapid. Available water capacity is low or moderate. Surface runoff is rapid. In unlimed areas the soil is very strongly acid to moderately acid.

In most areas this soil is used for cropland and pasture. In some areas it is used for urban development or is woodland.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Slope is a moderate limitation for onsite waste disposal, dwellings, and most other urban uses. Slope and frost action are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4A.

LSD—Lewisberry and Lansdale soils, 8 to 25 percent slopes, very stony

This map unit consists of strongly sloping and moderately steep, very deep Lewisberry gravelly sandy loam and deep Lansdale loam. These soils are on convex slopes on ridges and hills. They are well drained. They were mapped together because of their similarities in use, management, and slope. The map

unit is about 55 percent Lewisberry soils, 30 percent Lansdale soils, and 15 percent included soils. The areas are irregular or long and narrow in shape and range from 5 to 700 acres in size. Stones ranging in size from 1 to more than 3 feet across cover about 1 to 3 percent of the surface.

Typically, the Lewisberry soils have a surface layer of dark reddish brown, very friable gravelly sandy loam about 3 inches thick. The subsurface layer is reddish brown, very friable gravelly sandy loam about 9 inches thick. The subsoil is about 34 inches thick. It is reddish brown, friable gravelly sandy loam to a depth of 18 inches; reddish brown, firm gravelly sandy loam to a depth of 35 inches; and reddish brown, firm very gravelly sandy loam to a depth of 46 inches. The substratum to a depth of 62 inches is weak red, friable extremely gravelly sandy loam. Dusky red conglomerate bedrock is at a depth of about 62 inches. In some areas the soils are strongly sloping and steep. In some areas the solum is less than 40 inches thick. In a few areas the surface layer is loam, silt loam, or channery.

Typically, the Lansdale soils have a surface layer of very dark grayish brown, friable channery loam about 3 inches thick. The subsurface layer is brown, friable channery loam about 7 inches thick. The subsoil is about 20 inches thick. It is dark yellowish brown, friable loam to a depth of 17 inches and yellowish brown, friable and very friable sandy loam to a depth of 30 inches. The substratum to a depth of 47 inches is yellowish brown, very friable loamy sand and loose channery loamy sand. Fractured, dark grayish brown sandstone is at a depth of about 47 inches. In some areas the soils are gently sloping and very steep or depth to bedrock is less than 40 inches.

Included with these soils in mapping are a few, small, scattered areas of very deep Arendtsville soils on sides of narrow ridges and deep Penn soils on broad, undulating ridgetops on uplands. These soils have fewer rock fragments and less sand throughout than the Lewisberry soils and are deeper to bedrock than the Lansdale soils. Also included are a few, small areas of moderately deep Steinsburg soils around edges of ridges and some areas where a few, large rock fragments are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability is moderately rapid in the Lewisberry soils. In the Lansdale soils it is moderate in the surface layer, moderate or moderately rapid in the subsoil, and moderately rapid in the substratum. In both soils available water capacity is low or moderate and surface runoff is rapid. In unlimed areas the Lewisberry soils are very strongly acid to moderately acid and the Lansdale soils are very strongly acid or strongly acid.

In most areas these soils are used for woodland or are idle land. In some areas they are used for urban development.

These soils are unsuited to cultivated crops. They are poorly suited to permanent pasture. Use of most farm machinery is impractical because of stones and boulders on the surface.

Potential productivity for trees on these soils is moderately high. The major management concerns are erosion hazard and equipment limitation. Because of an erosion hazard, a gentle grade is needed on logging roads, skid trails, and landings and water bars, out-sloping road surfaces, culverts, and drop structures are needed to remove water. Ordinary crawler tractors and rubber-tired skidders cannot be operated safely on the steeper slopes. When the soils are wet logging roads become slippery and quickly rutted. Machine planting is practical in large areas.

Slope and stones and boulders beneath the surface are severe limitations for onsite waste disposal, dwellings, local roads and streets.

The land capability classifications are 6S for both the Lewisberry and Lansdale soils. The woodland ordination symbols are 4R for the Lewisberry soils and 4X for the Lansdale soils.

Lw—Lindside silt loam

This is a nearly level, very deep, moderately well drained soil on flood plains. Slopes are smooth and range from 0 to 3 percent. Areas of this soil are long and narrow in shape and range from 5 to 400 acres in size.

Typically, the surface layer is brown, friable silt loam about 10 inches thick. The subsoil is about 23 inches thick. It is brown, friable silt loam to a depth of 22 inches and brown, mottled, firm silt loam to a depth of 33 inches. The substratum to a depth of 60 inches is brown, mottled, firm silt loam. In some areas the soil has more sand and gravel or is subject to rare flooding. In some areas depth to bedrock is less than 60 inches. In some areas the surface layer is loam, sandy loam, silty clay loam, or gravelly. In a few areas the upper part of the solum is grayish brown.

Included with this soil in mapping are a few, small, scattered areas of well drained Chagrin soils on higher rises above the Lindside soil and a few, narrow, elongated areas of poorly drained Hatboro soils in shallow swales and drainageways below the Lindside soil. Included soils make up about 10 percent of the map unit.

Permeability in this Lindside soil is moderate in the surface layer, moderate or moderately slow in the

subsoil, and moderately slow to moderately rapid in the substratum. Available water capacity is high or very high. Surface runoff is slow. This soil is subject to frequent flooding for brief periods mainly in late winter and early spring. In unlimed areas this soil is strongly acid to slightly alkaline in the solum and moderately acid to slightly alkaline in the substratum.

In most areas this soil is used for cropland or pasture. In some small areas it is used for woodland or is idle land.

This soil is well suited to corn and soybeans. It is fairly well suited to small grain, however, because floodwater causes severe crop damage. The main hazard is frequent flooding. Existing, well maintained dikes and levees help to overcome flooding in large areas. Crop residue management, cover crops, and green manure crops help to maintain organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

This soil is unsuited as sites for onsite waste disposal, dwellings, and local roads and streets because flooding is a severe limitation.

The land capability classification is 2W. The woodland ordination symbol is 5A.

MdA—Mount Lucas silt loam, 0 to 3 percent slopes

This is a nearly level, deep, somewhat poorly drained soil on broad uplands and in depressions. Slopes are smooth. Areas of this soil are oval or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 8 inches thick. The subsoil is about 29 inches thick. It is brown, mottled, friable silty clay loam to a depth of 16 inches; yellowish brown, mottled, firm channery clay loam to a depth of 31 inches; and brown, mottled, firm channery clay loam to a depth of 37 inches. The substratum extends to a depth of 60 inches. It is brown, mottled, firm channery loam and sandy loam to a depth of 44 inches. Below that, it is yellowish brown, firm sandy loam. In some areas the soil is gently sloping. In some areas the solum is less than 30 inches thick or depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas of very deep, well drained Neshaminy soils on narrow, elongated ridges and on side ridges above the Mount Lucas soil. Also included are a few areas of very deep, poorly drained Watchung soils in swales and drainageways below the Mount Lucas soil. Also included are some small areas where many stones and boulders are on or below the surface. Included soils make up about 10 percent of the map unit.

Permeability in this Mount Lucas soil is moderate in the surface layer, slow or moderately slow in the subsoil, and slow to moderately rapid in the substratum. Available water capacity is moderate or high and surface runoff is slow. The seasonal high water table is at a depth of 6 to 18 inches. In unlimed areas this soil is strongly acid to slightly acid in the upper part of the solum, strongly acid to neutral in the lower part, and moderately acid to neutral in the substratum. The seasonal high water table restricts root penetration.

In most areas this soil is used for pasture. In some areas it is used for cropland or woodland or is idle land. In a few areas it is used for urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. The main limitation is the seasonal high water table. During periods when rainfall is below normal or poorly distributed, drought can damage crops. Existing, well maintained drainage systems help to overcome wetness. Leaving stubble on the surface and adding other organic material will conserve moisture. Crop residue management, cover crops, and green manure crops help to maintain organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. Water-tolerant species are favored in timber stands. The equipment limitation is the main management concern. The high water table restricts

use of equipment to midsummer, when the soil is dry, or to midwinter, when the soil is frozen or has a protective cover of snow. Machine planting is practical in large areas.

Wetness and slow or moderately slow permeability are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses. Wetness and frost action are severe limitations for local roads and streets.

The land capability classification is 2W. The woodland ordination symbol is 4W.

MdB—Mount Lucas silt loam, 3 to 8 percent slopes

This is a gently sloping, deep, somewhat poorly drained soil on broad uplands, benches, and depressions. Slopes are smooth or concave. Areas of this soil are irregular, oval, or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 8 inches thick. The subsoil is about 29 inches thick. It is brown, mottled, friable silty clay loam to a depth of 16 inches; yellowish brown, mottled, firm channery clay loam to a depth of 31 inches; and mottled, firm channery clay loam to a depth of 37 inches. The substratum extends to a depth of 60 inches. It is brown, mottled, firm channery loam and sandy loam to a depth of 44 inches. Below that, it is yellowish brown, firm sandy loam. In some areas the soil is nearly level and strongly sloping. In some areas the solum is less than 30 inches thick or depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas of very deep, well drained Neshaminy soils on narrow, elongated ridges and on side ridges above the Mount Lucas soil. Also included are a few areas of very deep, poorly drained Watchung soils in swales and drainageways below the Mount Lucas soil. Also included are some small areas where many stones and boulders are on or below the surface. Included soils make up about 10 percent of the map unit.

Permeability in this Mount Lucas soil is moderate in the surface layer, slow or moderately slow in the subsoil, and slow to moderately rapid in the substratum. Available water capacity is moderate or high and surface runoff is slow. The seasonal high water table is at a depth of 6 to 18 inches. In unlimed areas this soil is strongly acid to slightly acid in the upper part of the solum, strongly acid to neutral in the lower part, and moderately acid to neutral in the substratum. The seasonal high water table restricts root penetration.

In most areas this soil is used for cropland or pasture. In some areas it is used for woodland or urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the major hazard, and the seasonal high water table is the main limitation. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Existing, well maintained drainage systems will help to overcome wetness. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. Water-tolerant species are favored in timber stands. The equipment limitation is the main management concern. The high water table restricts use of equipment to midsummer, when the soil is dry, or to midwinter, when the soil is frozen or has a protective cover of snow. Machine planting is practical in large areas.

Wetness and slow or moderately slow permeability are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses. Wetness and frost action are severe limitations for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4W.

MeB—Mount Lucas silt loam, 0 to 8 percent slopes, very bouldery

This is a nearly level and gently sloping, deep, somewhat poorly drained soil on broad uplands and in depressions. Slopes are smooth or concave. Areas of

this soil are irregular, oval, or long and narrow in shape and range from 5 to 100 acres in size. Stones and boulders ranging in size from 10 inches to more that 6 feet across cover 1 to 3 percent of the surface.

Typically, the surface layer is dark brown, friable silt loam about 8 inches thick. The subsoil is about 29 inches thick. It is brown, mottled, friable silty clay loam to a depth of 16 inches; yellowish brown, mottled, firm channery clay loam to a depth of 31 inches; and brown, mottled, firm channery clay loam to a depth of 37 inches. The substratum extends to a depth of 60 inches. It is brown, mottled, firm channery loam and sandy loam to a depth of 44 inches. Below that, it is yellowish brown, firm sandy loam. In some areas the soil is nearly level and strongly sloping. In some areas the solum is less than 30 inches thick or depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas of very deep, well drained Neshaminy soils on narrow, elongated ridges and on sides of ridges above the Mount Lucas soil. Also included are a few areas of very deep, poorly drained Watchung soils in swales and drainageways below the Mount Lucas soil. Also included are some small areas where many stones and boulders are on or below the surface. Included soils make up about 10 percent of the map unit.

Permeability in this Mount Lucas soil is moderate in the surface layer, slow or moderately slow in the subsoil, and slow to moderately rapid in the substratum. Available water capacity is moderate or high and surface runoff is slow. The seasonal high water table is at a depth of 6 to 18 inches. In unlimed areas this soil is strongly acid to slightly acid in the upper part of the solum, strongly acid to neutral in the lower part, and moderately acid to neutral in the substratum. The seasonal high water table restricts root penetration.

In most areas this soil is used for woodland or is idle land.

This soil is unsuited to cultivated crops and poorly suited to permanent pasture because of stones and boulders on the surface.

Potential productivity for trees on this soil is moderately high. Water-tolerant species are favored in timber stands. The equipment limitation is the main management concern. The high water table restricts use of equipment to midsummer, when the soil is dry, or to midwinter, when the soil is frozen or has a protective cover of snow. Machine planting is practical in large areas.

Wetness, stones and boulders beneath the surface, and slow permeability are severe limitations for onsite waste disposal. Wetness and large stones or boulders are severe limitations for dwellings and most other urban uses. Wetness, large stones or boulders, and frost action are severe limitations for local roads and streets.

The land capability classification is 6S. The woodland ordination symbol is 4W.

MOB—Mt. Airy and Manor soils, 3 to 8 percent slopes

This map unit consists of gently sloping, moderately deep, somewhat excessively drained Mt. Airy channery silt loam and very deep, somewhat excessively drained Manor channery loam. These soils are on ridgetops. They were mapped together because of their similarities in use, management, and slope. The map unit is about 55 percent Mt. Airy soils, 30 percent Manor soils, and 15 percent included soils. Slopes are smooth or convex. Areas are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the Mt. Airy soils have a surface layer of dark brown, friable channery silt loam about 8 inches thick. The subsoil is about 12 inches thick. It is yellowish brown, friable channery silt loam to a depth of 15 inches and strong brown, friable very channery silt loam to a depth of 20 inches. The substratum to a depth of 32 inches is brown and yellowish brown, very firm extremely channery, micaceous loam. Fractured schist bedrock is at a depth of about 32 inches. In some areas the soils are nearly level and strongly sloping. In some areas depth to bedrock is less than 20 inches.

Typically, the Manor soils have a surface layer of dark brown, very friable channery loam about 8 inches thick. The subsoil is about 16 inches thick. It is strong brown, very friable channery silt loam to a depth of 15 inches and reddish yellow, very friable channery loam to a depth of 24 inches. The substratum to a depth of 60 inches is reddish yellow, very friable, very micaceous channery loam. In some areas the soil is level and strongly sloping. In some areas depth to bedrock is less than 60 inches. In a few areas the surface layer is very channery or extremely channery.

Included with these soils in mapping are a few, scattered areas of very deep, well drained Chester and Edgemont soils and deep Glenelg soils on undulating ridgetops and side slopes above the Mt. Airy and Manor soils. Also included are a few areas of very deep, moderately well drained Glenville soils in shallow depressions and along drainageways. These soils contain fewer rock fragments and less sand throughout

than the Mt. Airy and Manor soils. Glenville soils have a fragipan and are grayish in the lower part of the subsoil. Also included are some small areas where many stones and boulders are on the surface or in the soil. Included soils make up about 15 percent of the map unit.

Permeability in the Mt. Airy soils is moderate in the surface layer and moderate or moderately rapid in the subsoil and the substratum. Permeability in the Manor soils is moderate in the solum and moderate or moderately rapid in the substratum. On both soils available water capacity is low and surface runoff is medium or rapid. In unlimed areas the Mt. Airy soils are very strongly acid or strongly acid. The Manor soils are extremely acid to moderately acid. Depth to bedrock in the Mt. Airy soils restricts root penetration.

In most areas this soil is used for cropland, pasture, or woodland. In some areas it is used for urban development or is idle land.

These soils are well suited to most specialty crops. They are fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard, and the low available water during low rainfall is a limitation. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, terraces, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

These soils are well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on these soils is moderately high. The main management concern is seedling mortality. Using special planting stock and harvesting while leaving some mature trees to provide shade and protection help to reduce seedling mortality. Machine planting is practical in large areas.

On the Mt. Airy soils, depth to bedrock is a severe limitation for onsite waste disposal. On the Manor soils, moderate or moderately rapid permeability is a moderate limitation for onsite waste disposal. These soils are suitable as sites for dwellings without basements. Depth to bedrock is a moderate limitation for dwellings with basements and most other urban uses. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 3E for the Mt. Airy soils and 2E for the Manor soils. The woodland ordination symbol is 3F on the Mt. Airy soils and 4A on the Manor soils.

MOC—Mt. Airy and Manor soils, 8 to 15 percent slopes

This map unit consists of strongly sloping, moderately deep, somewhat excessively drained Mt. Airy channery silt loam and very deep, somewhat excessively drained Manor channery loam. These soils are on broad ridgetops and side slopes. They were mapped together because of their similarities in use, management, and slope. The map unit is about 55 percent Mt. Airy soils, 30 percent Manor soils, and 15 percent included soils. Slopes are smooth or convex. Areas of these soils are irregular or long and narrow in shape and range from 5 to 200 acres in size.

Typically, the Mt. Airy soils have a surface layer of dark brown, friable channery silt loam about 8 inches thick. The subsoil is about 12 inches thick. It is yellowish brown, friable channery silt loam to a depth of 15 inches and strong brown, friable very channery silt loam to a depth of 20 inches. The substratum to a depth of 32 inches is brown and yellowish brown, very firm extremely channery, micaceous loam. Fractured schist bedrock is at a depth of about 32 inches. In some areas the soils are gently sloping and moderately steep. In some areas depth to bedrock is less than 20 inches.

Typically, the Manor soils have a surface layer of dark brown, very friable channery loam about 8 inches thick. The subsoil is about 16 inches thick. It is strong brown, very friable channery silt loam to a depth of 18 inches and reddish yellow, very friable channery loam to a depth of 24 inches. The substratum to a depth of 60 inches is reddish yellow, very friable, very micaceous channery loam. In some areas the soils are gently sloping and moderately steep. In some areas depth to bedrock is less than 60 inches. In a few areas the surface layer is very channery or extremely channery.

Included with these soils in mapping are a few, scattered areas of very deep, well drained Chester, Edgemont, and Glenelg soils on undulating ridgetops and side slopes above the Mt. Airy and Manor soils.

Also included are a few areas of very deep, moderately well drained Glenville soils in shallow depressions and along drainageways. These soils have fewer rock fragments and less sand throughout than the Mt. Airy and Manor soils. Glenville soils have a fragipan and are grayish in the lower part of the subsoil. Also included are some small areas where many stones and boulders are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability in the Mt. Airy soils is moderate in the surface layer and moderate or moderately rapid in the subsoil and the substratum. In the Manor soils it is moderate in the solum and moderate or moderately rapid in the substratum. In both soils available water capacity is low and surface runoff is medium or rapid. In unlimed areas the Mt. Airy soils are very strongly acid or strongly acid and the Manor soils are extremely acid to moderately acid. Depth to bedrock in the Mt. Airy soils restricts root penetration.

In most areas these soils are used for cropland, pasture, or woodland. In some areas they are used for urban development or are idle land.

These soils are fairly well suited to most specialty crops. They are suited to corn, soybeans, and small grain. Erosion is the main hazard, and low available water during low rainfall is a limitation. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, terraces, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

These soils are well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on these soils is moderately high. The main management concern is seedling mortality. Using special planting stock and harvesting while leaving some mature trees to provide shade and protection help to reduce seedling mortality. Machine planting is practical in large areas.

For onsite waste disposal depth to bedrock and slope are severe limitations on the Mt. Airy soils and moderate or moderately rapid permeability is a moderate limitation on the Manor soils. On both soils slope is a moderate limitation for dwellings without basements. On both soils depth to bedrock and slope are moderate limitations for dwellings with basements and most other urban uses. On both soils slope and frost action are moderate limitations for local roads and streets.

The land capability classification is 4E for the Mt. Airy soils and 3E for the Manor soils. The woodland ordination symbol is 3F on the Mt. Airy soils and 4A on the Manor soils.

MOD—Mt. Airy and Manor soils, 15 to 25 percent slopes

This map unit consists of moderately steep, moderately deep, somewhat excessively drained Mt. Airy channery silt loam and very deep, somewhat excessively drained Manor channery loam. These soils are on ridges and hills (fig. 15). They were mapped together because of their similarities in use, management, and slope. The map unit is about 60 percent Mt. Airy soils, 25 percent Manor soils, and 15 percent included soils. Slopes are convex. Areas of these soils are irregular or long and narrow in shape and range from 5 to 300 acres in size.

Typically, the Mt. Airy soils have a surface layer of dark brown, friable channery silt loam about 8 inches thick. The subsoil is about 12 inches thick. It is yellowish brown, friable channery silt loam to a depth of 15 inches and strong brown, friable very channery silt loam to a depth of 20 inches. The substratum to a depth of 32 inches is brown and yellowish brown, very firm extremely channery, micaceous loam. Fractured schist bedrock is at a depth of about 32 inches. In some areas the soils are strongly sloping and steep. In some areas depth to bedrock is less than 20 inches.

Typically, the Manor soils have a surface layer of dark brown, very friable channery loam about 8 inches thick. The subsoil is about 16 inches thick. It is strong brown, very friable channery silt loam to a depth of 18 inches and reddish yellow, very friable channery loam to a depth of 24 inches. The substratum to a depth of 60 inches is reddish yellow, very friable, very micaceous channery loam. In some areas the soils are strongly sloping and steep. In some areas depth to bedrock is less than 60 inches. In a few areas the surface layer is very channery or extremely channery.

Included with these soils in mapping are a few, scattered areas of very deep, well drained Chester and Edgemont soils and deep Glenelg soils on undulating

ridgetops and side slopes above the Mt. Airy and Manor soils. Also included are a few areas of very deep, moderately well drained Glenville soils in shallow depressions and along drainageways. These soils have fewer rock fragments and less sand throughout than the Mt. Airy and Manor soils. Glenville soils have a fragipan and are grayish in the lower part of the subsoil. Also included are some small areas where many stones and boulders are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability in the Mt. Airy soils is moderate in the surface layer and moderate or moderately rapid in the subsoil and the substratum. In the Manor soils it is moderate in the solum and moderate or moderately rapid in the substratum. On both soils available water capacity is low and surface runoff is medium or rapid. In unlimed areas the Mt. Airy soils are very strongly acid or strongly acid and the Manor soils are extremely acid to moderately acid. In the Mt. Airy soils depth to bedrock restricts root penetration.

In most areas these soils are used for pasture or woodland or are idle land. In a few areas they are used for cropland and urban development.

These soils are poorly suited to most specialty crops and are unsuited to cultivated crops because of slope and low available water capacity.

These soils are fairly well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on these soils is moderately high. Erosion hazard, equipment limitation, and seedling mortality are major management concerns. When the soil is wet, logging roads become slippery and quickly rutted. Use of planting or logging equipment is limited during wet periods. Using special planting stock and harvesting while leaving some mature trees to provide shade and protection help to reduce seedling mortality. Thinning or removing undesirable species are suitable management practices. Machine planting is generally practical in large areas.

Slope is a severe limitation for onsite waste disposal, dwellings, and local roads and streets.

The land capability classification is 6E for the Mt. Airy soils and 4E for the Manor soils. The woodland ordination symbol is 3F on the Mt. Airy soils and 4R on the Manor soils.

Figure 15.—A typical area of dominantly Mt. Airy and Manor soils, 15 to 25 percent slopes.

MOE—Mt. Airy and Manor soils, 25 to 35 percent slopes

This map unit consists of steep and very steep, moderately deep, somewhat excessively drained Mt. Airy channery silt loam and very deep, somewhat excessively drained Manor channery loam. These soils are on ridges and hills on highly dissected uplands. They were mapped together because of their similarities in use, management, and slope. The map unit is about 60 percent Mt. Airy soils, 25 percent Manor soils, and 15 percent included soils. Slopes are convex. Areas of these soils are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the Mt. Airy soils have a surface layer of dark brown, friable channery silt loam about 8 inches thick. The subsoil is about 12 inches thick. It is yellowish brown, friable channery silt loam to a depth of 15 inches and strong brown, friable very channery silt loam to a depth of 20 inches. The substratum to a depth of 32 inches is brown and yellowish brown, very firm extremely channery, micaceous loam. Fractured schist bedrock is at a depth of about 32 inches. In some areas the soils are moderately steep or depth to bedrock is less than 20 inches.

Typically, the Manor soils have a surface layer of dark brown, very friable channery loam about 8 inches thick. The subsoil is about 16 inches thick. It is strong brown, very friable channery silt loam to a depth of 18 inches and reddish yellow, very friable channery loam to a depth of 24 inches. The substratum to a depth of 60 inches is reddish yellow, very friable, very micaceous channery loam. In some areas the soils are moderately steep or depth to bedrock is less than 60 inches. In a few areas the surface layer is very channery or extremely channery.

Included with these soils in mapping are a few, scattered areas of very deep, well drained Chester and Edgemont soils and deep Glenelg soils on undulating ridgetops and side slopes above the Mt. Airy and Manor soils. Also included are a few areas of very deep, moderately well drained Glenville soils in shallow depressions and along drainageways. These soils contain fewer rock fragments and less sand throughout than the Mt. Airy and Manor soils. Glenville soils have a fragipan and are grayish in the lower part of the subsoil. Also included are some small areas where many stones and boulders are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability in the Mt. Airy soils is moderate in the surface layer and moderate or moderately rapid in the subsoil and the substratum. In the Manor soils it is moderate in the solum and moderate or moderately rapid in the substratum. On both soils available water capacity is low and surface runoff is medium or rapid. In unlimed areas the Mt. Airy soils are very strongly acid or strongly acid and the Manor soils are extremely acid to moderately acid. On the Mt. Airy soils depth to bedrock restricts root penetration.

In most areas these soils are used for pasture or woodland or are idle land.

These soils are unsuited to cultivated crops and poorly suited to permanent pasture because of slope and low available water capacity. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soils are wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on these soils is moderately high. Erosion hazard, equipment limitation, and seedling mortality are major management concerns. When the soils are wet, logging roads become slippery and quickly rutted. Use of planting or logging equipment is limited during wet periods. Using special planting stock and harvesting while leaving some mature trees to provide shade and protection help to overcome seedling mortality. Thinning or removing undesirable species are suitable management practices. Machine planting is generally practical in large areas.

Slope is a severe limitation for onsite waste disposal, dwellings, and local roads and streets.

The land capability classification is 7E for the Mt. Airy soils and 6E for the Manor soils. The woodland ordination symbol is 3F on the Mt. Airy soils and 4R on the Manor soils.

MPD—Mt. Airy and Manor soils, 8 to 25 percent slopes, very stony

This map unit consists of strongly sloping and moderately steep, moderately deep, somewhat excessively drained Mt. Airy channery silt loam and very deep, somewhat excessively drained Manor channery loam. These soils are on broad ridges and hills. They were mapped together because of similarities in use, management, and slope. The map unit is about 55 percent Mt. Airy soils, 30 percent Manor soils, and 15 percent included soils. Slopes are convex. Areas of these soils are irregular or long and

narrow in shape and range from 5 to 300 acres in size. Stones ranging from 1 to more than 3 feet in diameter cover about 1 to 3 percent of the surface.

Typically, the Mt. Airy soils have a surface layer of very dark grayish brown, friable channery silt loam about 3 inches thick. The subsurface layer is brown, friable channery silt loam about 5 inches thick. The subsoil is about 12 inches thick. It is yellowish brown, friable channery silt loam to a depth of about 15 inches and yellowish brown, friable very channery silt loam to a depth of about 20 inches. The substratum to a depth of 32 inches is brown and yellowish brown, very firm extremely channery, micaceous loam. Fractured schist bedrock is at a depth of about 32 inches. In some areas the soils are gently sloping and steep or depth to bedrock is less than 20 inches.

Typically, the Manor soils have a surface layer of dark brown, very friable channery loam about 4 inches thick. The subsurface layer is brown, very friable channery loam about 4 inches thick. The subsoil is about 16 inches thick. It is strong brown, very friable channery silt loam to a depth of about 18 inches and reddish yellow, very friable channery loam to a depth of about 24 inches. The substratum to a depth of 60 inches is reddish yellow, very friable channery loam. In some areas the soils are gently sloping and steep or depth to bedrock is less than 60 inches. In a few areas the surface layer is very channery or extremely channery.

Included with these soils in mapping are a few, scattered areas of very deep, well drained Chester and Edgemont soils and deep Glenelg soils on undulating ridgetops and side slopes above the Mt. Airy and Manor soils. Also included are a few areas of very deep, moderately well drained Glenville soils in shallow depressions and along drainageways. These soils contain fewer rock fragments and less sand throughout than the Mt. Airy and Manor soils. Glenville soils have a fragipan and are grayish in the lower part of the subsoil. Also included are some small areas where many stones and boulders are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability in the Mt. Airy soils is moderate in the surface layer and moderate or moderately rapid in the subsoil and the substratum. In the Manor soils it is moderate in the solum and moderate or moderately rapid in the substratum. On both soils available water capacity is low and surface runoff is medium or rapid. In unlimed areas the Mt. Airy soils are very strongly acid or strongly acid and the Manor soils are extremely acid to moderately acid. On the Mt. Airy soils depth to bedrock restricts root penetration.

In most areas these soils are used for woodland or are idle land. In a few areas they are used for cropland or urban development.

These soils are unsuited to cultivated crops and poorly suited to most specialty crops because of slope and stones and boulders on the surface.

These soils are fairly well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on these soils is moderately high. Erosion hazard, equipment limitation, and seedling mortality are major management concerns. When the soils are wet, logging roads become slippery and quickly rutted. Use of planting or logging equipment is limited during wet periods. Using special planting stock and harvesting while leaving some mature trees to provide shade and protection help to reduce seedling mortality. Thinning or removing undesirable species are suitable management practices. Machine planting is generally practical in large areas.

Slope and stones and boulders beneath the surface are severe limitations for onsite waste disposal, dwellings, and local roads and streets.

The land capability classification is 6S for both the Mt. Airy and Manor soils. The woodland ordination symbol is 3F on the Mt. Airy soils and 4R on the Manor soils.

MRF—Mt. Airy and Manor soils, 25 to 60 percent slopes, extremely stony

This map unit consists of steep and very steep, moderately deep, somewhat excessively drained Mt. Airy channery silt loam and very deep, somewhat excessively drained Manor channery loam. These soils are on ridges and hills on highly dissected uplands. They were mapped together because of similarities in use, management, and slope. The map unit is about 60 percent Mt. Airy soils, 25 percent Manor soils, and 15 percent included soils. Slopes are convex. Areas of these soils are irregular or long and narrow in shape and range from 5 to 500 acres in size. Stones and boulders ranging from 1 to more than 10 feet in diameter cover about 3 to 15 percent of the surface.

Typically, the Mt. Airy soils have a surface layer of

very dark grayish brown, friable channery silt loam about 3 inches thick. The subsurface layer is brown, friable channery silt loam about 5 inches thick. The subsoil is about 12 inches thick. It is yellowish brown, friable channery silt loam to a depth of about 15 inches and strong brown, friable very channery silt loam to a depth of about 20 inches. The substratum to a depth of 32 inches is brown and yellowish brown, very firm extremely channery, micaceous loam. Fractured schist bedrock is at a depth of about 32 inches. In some areas the soils are moderately steep or depth to bedrock is less than 20 inches.

Typically, the Manor soils have a surface layer of dark brown, very friable channery loam about 4 inches thick. The subsurface layer is brown, very friable channery loam about 4 inches thick. The subsoil is about 16 inches thick. It is strong brown, very friable channery silt loam to a depth of about 18 inches and reddish yellow, very friable channery loam to a depth of about 24 inches. The substratum to a depth of 60 inches reddish yellow, very friable, very micaceous channery loam. In some areas the soils are moderately steep or depth to bedrock is less than 60 inches. In a few areas the surface layer is very channery or extremely channery.

Included with these soils in mapping are a few, scattered areas of very deep, well drained Chester and Edgemont soils and deep Glenelg soils on undulating ridgetops and side slopes above the Mt. Airy and Manor soils. Also included are a few areas of very deep, moderately well Glenville soils in shallow depressions and along drainageways. These soils contain fewer rock fragments and less sand throughout than the Mt. Airy and Manor soils. Glenville soils have a fragipan and are grayish in the lower part of the subsoil. Also included are some small areas where many stones and boulders are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability in the Mt. Airy soils is moderate in the surface layer and moderate or moderately rapid in the subsoil and the substratum. In the Manor soils it is moderately rapid in the solum and moderate or moderately rapid in the substratum. On both soils available water capacity is low and surface runoff is medium or rapid. In unlimed areas the Mt. Airy soils are very strongly acid or strongly acid and the Manor soils are extremely acid to moderately acid. On the Mt. Airy soils depth to bedrock restricts root penetration.

In most areas these soils are used for pasture or woodland or are idle land.

These soils are unsuited to cultivated crops and some specialty crops and poorly suited to grasses and legumes for permanent pasture because of slope and stones and boulders on the surface. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soils are wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. Some suitable ones include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on these soils is moderately high. Erosion hazard, equipment limitation, and seedling mortality are major management concerns. When the soils are wet, logging roads become slippery and quickly rutted. Use of planting or logging equipment is limited during wet periods. Using special planting stock and harvesting while leaving some mature trees to provide shade and protection help to reduce seedling mortality. Thinning or removing undesirable species are suitable management practices. Machine planting is generally practical in large areas.

Slope and stones and boulders beneath the surface are severe limitations for onsite waste disposal, dwellings, local roads and streets.

The land capability classification is 7S for both the Mt. Airy and Manor soils. The woodland ordination symbol is 3R on the Mt. Airy soils and 4R on the Manor soils.

MvB—Murrill gravelly loam, 3 to 8 percent slopes

This is a gently sloping, very deep, well drained soil on foot slopes and benches. Slopes are smooth, concave, or convex. Areas of this soil are irregular or long in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, friable gravelly loam about 10 inches thick. The subsoil is about 62 inches thick. It is strong brown, friable gravelly loam and channery loam to a depth of about 28 inches; yellowish red, friable, channery clay loam to a depth of about 36 inches; red, firm channery clay loam to a depth of about 42 inches; yellowish red, firm channery silty clay loam and silty clay loam to a depth of about 58 inches; and strong brown, firm clay loam to a depth of about 72 inches. In some areas the soil is nearly level and strongly sloping or has less clay in the

lower part of the subsoil. In a few areas the soil has gray mottles at a depth of less than 36 inches. In some areas the surface layer is gravelly silt loam, gravelly sandy loam, channery, or stony.

Included with this soil in mapping are a few, small, scattered areas of Duffield soils on low rises and at the base of narrow side slopes below the Murrill soil. Duffield soils have fewer rock fragments throughout. Included soils make up about 10 percent of the map unit.

Permeability in this Murrill soil is moderate in the upper part of the solum and moderate or moderately slow in the lower part. Available water capacity is moderate and surface runoff is medium. In unlimed areas this soil is very strongly acid to moderately acid.

In most areas this soil is used for cropland or pasture. In some areas it is used for woodland or urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No major hazards or limitations affect use and management. Machine planting is practical in large areas.

This soil is suited to sites for onsite waste disposal and dwellings without basements. Shrinking and swelling is a moderate limitation for dwellings with basements and most other urban uses. Low strength and frost action are moderate limitations for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

MvC—Murrill gravelly loam, 8 to 15 percent slopes

This is a strongly sloping, very deep, well drained soil on foot slopes and benches. Slopes are smooth concave or convex. Areas of this soil are irregular or long in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, friable gravelly loam about 10 inches thick. The subsoil is about 62 inches thick. It is strong brown, friable gravelly loam and channery loam to a depth of about 28 inches; yellowish red and red, friable channery clay loam to a depth of about 36 inches; red, firm channery clay loam to a depth of about 42 inches; yellowish red, firm channery silty clay loam and silty clay loam to a depth of about 58 inches; and strong brown, firm clay loam to a depth of about 72 inches. In some areas the soil is gently sloping and moderately steep or has less clay in the lower part of the subsoil. In a few areas the soil has gray mottles at a depth of less than 36 inches. In some areas the surface layer is gravelly silt loam, gravelly sandy loam, channery, or stony.

Included with this soil in mapping are a few, small, scattered areas of Duffield soils on low rises and at the base of narrow side slopes below the Murrill soil. Duffield soils have fewer rock fragments throughout. Included soils make up about 10 percent of the map unit.

Permeability in this Murrill soil is moderate in the upper part of the solum and moderate or moderately slow in the lower part. Available water capacity is moderate and surface runoff is rapid. In unlimed areas this soil is very strongly acid to moderately acid.

In most areas this soil is used for cropland or pasture. In some areas it is used for orchards or woodland or is idle land. In a few areas it is used for urban development.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and

causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No major hazards or limitations affect use and management. Machine planting is practical in large areas.

Slope is a moderate limitation for onsite waste disposal and dwellings without basements. Slope and shrinking and swelling are moderate limitations for dwellings with basements and most other urban uses. Slope, low strength, and frost action are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4A.

NaB—Neshaminy channery silt loam, 3 to 8 percent slopes

This is a gently sloping, very deep, well drained soil on ridgetops. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, very friable channery silt loam about 8 inches thick. The subsoil is about 47 inches thick. It is strong brown, friable channery silt loam to a depth of about 15 inches; yellowish red, friable clay loam and channery clay loam to a depth of about 34 inches; and yellowish red, firm clay loam to a depth of about 45 inches. The substratum to a depth of 72 inches is reddish brown, firm clay loam. In some areas the soil is nearly level and strongly sloping. In a few areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, scattered areas of deep, somewhat poorly drained Mount Lucas soils on low rises and at the base of ridges and hills. Also included are very deep, poorly drained Watchung soils in shallow depressions and along drainageways. Also included are some areas where many stones and boulders are on or below the surface. Also included are some areas where no stones and boulders are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability in this Neshaminy soil is moderate in the surface layer and moderately slow in the subsoil and the substratum. Available water capacity is moderate and surface runoff is medium. In unlimed areas this soil is very strongly acid to moderately acid in the upper part of the solum and strongly acid to slightly acid in the lower part and in the substratum.

In most areas this soil is used for cropland, orchards, and woodland. In a few areas it is used for urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. Examples are a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No major hazards or limitations affect use and management. Machine planting is practical in large areas.

Moderately slow permeability is a severe limitation for onsite waste disposal. The soil is suitable as sites for dwellings and most other urban uses. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

NaC—Neshaminy channery silt loam, 8 to 15 percent slopes

This is a strongly sloping, very deep, well drained soil on ridgetops and side slopes. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, very friable channery silt loam about 8 inches thick. The subsoil is about 47 inches thick. It is strong brown,

friable channery silt loam to a depth of about 15 inches; yellowish red, friable clay loam and channery clay loam to a depth of about 34 inches; and yellowish red, firm clay loam to a depth of about 55 inches. The substratum to a depth of 72 inches is reddish brown, firm clay loam. In some areas the soil is gently sloping and moderately steep. In a few areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, scattered areas of deep, somewhat poorly Mount Lucas soils on low rises and at the base of ridges and hills. Also included are very deep, poorly drained Watchung soils in shallow depressions and along drainageways. Also included are some areas where many stones and boulders are on or below the surface. Also included are some areas where no stones and boulders are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability in this Neshaminy soil is moderate in the surface layer and moderately slow in the subsoil and the substratum. Available water capacity is moderate and surface runoff is rapid. In unlimed areas this soil is very strongly acid to moderately acid in the upper part of the solum and strongly acid to slightly acid in the lower part and in the substratum.

In most areas this soil is used for cropland, orchards, and woodland. In some areas it is used for urban development.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No major hazards or limitations affect uses and management. Machine planting is practical in large areas.

Moderately slow permeability and slope are severe limitations for onsite waste disposal. Slope is a moderate limitation for dwellings and most other urban uses. Slope and frost action are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4A.

NdB—Neshaminy channery silt loam, 0 to 8 percent slopes, extremely bouldery

This is a nearly level and gently sloping, very deep, well drained soil on ridgetops. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size. Stones and boulders ranging in size from 10 inches to more than 10 feet in diameter cover about 3 to 5 percent of the surface.

Typically, the surface layer is dark brown, very friable channery silt loam about 4 inches thick. The subsurface layer is brown, channery silt loam about 4 inches thick. The subsoil is about 47 inches thick. It is strong brown, friable channery silt loam to a depth of about 15 inches; yellowish red, friable clay loam and channery clay loam to a depth of about 34 inches; and yellowish red, firm clay loam to a depth of about 55 inches. The substratum to a depth of 72 inches is reddish brown, firm clay loam. In some areas the soil is nearly level and strongly sloping or has more clay. In a few areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, scattered areas of deep, somewhat poorly Mount Lucas soils on low rises and at the base of ridges and hills. Also included are some areas where many stones and boulders are on or below the surface. Also included are some areas where no stones and boulders are on or below the surface. Included areas make up about 10 percent of the map unit.

Permeability in this Neshaminy soil is moderate in the surface layer and moderately slow in the subsoil and the substratum. Available water capacity is moderate and surface runoff is medium. In unlimed areas this soil is very strongly acid to moderately acid in the upper part of the solum and strongly acid to slightly acid in the lower part and in the substratum.

In most areas this soil is used for woodland. In a few areas it is used for orchards, pasture, or urban development or is idle land.

This soil is unsuited to cultivated crops and permanent pasture. Use of most farm machinery is impractical because of stones and boulders on the surface.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. Ordinary crawler tractors and rubber-tired skidders cannot be operated safely on these soils because large stones and boulders on the surface are limitations.

Stones and boulders beneath the surface and moderately slow permeability are severe limitations for onsite waste disposal. The soil is suitable as sites for dwellings and most other urban uses. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 7S. The woodland ordination symbol is 4X.

NdD—Neshaminy channery silt loam, 8 to 25 percent slopes, extremely bouldery

This is a strongly sloping and moderately steep, very deep, well drained soil on ridges and hills. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 400 acres in size. Stones and boulders ranging in size from 10 inches to more than 10 feet in diameter cover about 3 to 15 percent of the surface.

Typically, the surface layer is dark brown, very friable channery silt loam about 4 inches thick. The subsurface layer is brown, channery silt loam about 4 inches thick. The subsoil is about 47 inches thick. It is strong brown, friable channery silt loam to a depth of about 15 inches; yellowish red, friable clay loam and channery clay loam to a depth of about 34 inches; and yellowish red, firm clay loam to a depth of about 55 inches. The substratum to a depth of 72 inches is reddish brown, firm clay loam. In some areas the soil is gently sloping and steep or has more clay in the solum. In a few areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, scattered areas of deep, somewhat poorly drained Mount Lucas soils on low rises and at the base of ridges and hills. Also included are some areas where many stones and boulders are on or below the surface. Also included are some areas where no stones and boulders are on or below the surface. Included areas make up about 10 percent of the map unit.

Permeability in this Neshaminy soil is moderate in the surface layer and moderately slow in the subsoil and the substratum. Available water capacity is moderate and surface runoff is rapid. In unlimed areas this soil is very strongly acid to moderately acid in the upper part of the solum and strongly acid to slightly acid in the lower part and in the substratum.

In most areas this soil is used for woodland. In a few areas it is used for orchards, pasture, or urban development or is idle land.

This soil is unsuited to cultivated crops and permanent pasture and use of most farm machinery is impractical because of stones and boulders on the surface.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. Ordinary crawler tractors and rubber-tired skidders cannot be operated safely on these soils because slope and large stones and boulders on the surface are moderate limitations.

Moderately slow permeability and slope are severe limitations for onsite waste disposal. Slope is a severe limitation for dwellings and local roads and streets.

The land capability classification is 7S. The woodland ordination symbol is 4X.

NdE—Neshaminy channery silt loam, 25 to 45 percent slopes, extremely bouldery

This is a steep and very steep, very deep, well drained soil on ridges and hills. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 500 acres in size. Stones and boulders ranging in size from 10 inches to more than 10 feet in diameter cover about 3 to 15 percent of the surface.

Typically, the surface layer is dark brown, very friable channery silt loam about 4 inches thick. The subsurface layer is brown, channery silt loam about 4 inches thick. The subsoil is about 47 inches thick. It is strong brown, friable channery silt loam to a depth of about 15 inches; yellowish red, friable clay loam and channery clay loam to a depth of about 34 inches; and yellowish red, firm clay loam to a depth of about 55 inches. The substratum to a depth of 72 inches is reddish brown, firm clay loam. In some areas the soil is moderately steep. In some areas the solum has more clay or depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, scattered areas of deep, somewhat poorly Mount Lucas soils on low rises and at the base of ridges and hills. Also included are some areas where many stones and boulders are on or below the surface. Also included are some areas where no stones and boulders are on or below the surface. Included areas make up about 10 percent of the map unit.

Permeability in this Neshaminy soil is moderate in the surface layer and moderately slow in the subsoil

and the substratum. Available water capacity is moderate and surface runoff is very rapid. In unlimed areas this soil is very strongly acid to moderately acid in the upper part of the solum and strongly acid to slightly acid in the lower part and in the substratum.

In most areas this soil is used for woodland. In a few areas it is used for orchards, pasture, or urban development or is idle land.

This soil is unsuited to cultivated crops and permanent pasture. Use of most farm machinery is impractical because of slope and stones and boulders on the surface.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. Ordinary crawler tractors and rubber-tired skidders cannot be operated safely on these soils because slope and large stones and the boulders on the surface are moderate limitations.

Slope and stones and boulders beneath the surface are severe limitations for onsite waste disposal, dwellings, local roads and streets.

The land capability classification is 7S. The woodland ordination symbol is 4X.

Pa—Penlaw silt loam

This is a nearly level, very deep, somewhat poorly drained soil on broad uplands, in depressions, and on lowlands. Slopes are smooth or concave and range from 0 to 3 percent. Areas of this soil are oval or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 10 inches thick. The subsoil is about 37 inches thick. It is yellowish brown, mottled, friable silty clay loam to a depth of about 20 inches; yellowish brown, mottled, very firm and brittle gravelly silt loam to a depth of about 26 inches; yellowish brown, mottled, very firm and brittle silty clay loam to a depth of about 38 inches; and yellowish brown, mottled, firm and brittle gravelly silt loam to a depth of about 47 inches. The substratum to a depth of 60 inches is yellowish brown, firm gravelly silt loam. In some areas the soil is gently sloping, is predominantly gray throughout, or does not have a fragipan. In a few areas the solum has more clay.

Included with this soil in mapping are a few, small, scattered areas of very deep, well drained Conestoga and Duffield soils on broad ridgetops above the Penlaw soil. Also included are a few, small areas of very deep, well drained Elk soils on low rises and at the base of ridges and hills on stream terraces. Conestoga soils have more sand and less silt throughout than the Penlaw soil. Conestoga and Elk soils do not have a fragipan. Also included are a few, small areas of moderately well drained Lindside soils on low rises on bottom lands. Also included are some areas where many stones and boulders are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability in this Penlaw soil is moderate in the upper part of the solum, slow in the fragipan, and slow or moderately slow in the substratum. Available water capacity is moderate and surface runoff is slow. The seasonal high water table is at a depth of 6 to 18 inches. The fragipan is at a depth of 15 to 30 inches. In unlimed areas this soil is moderately acid to neutral throughout. The seasonal high water table and depth to the fragipan restrict root penetration.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. The seasonal high water table and slow permeability in the fragipan are major limitations. During periods when rainfall is below normal or poorly distributed, drought can damage crops. Existing, well maintained drainage systems help to overcome wetness. Leaving stubble on the surface and adding other organic material conserve moisture. Crop residue management, cover crops, and green manure crops help to maintain organic matter content and to improve soil tilth.

This soil is well suited to pasture. It is poorly suited to deep-rooted legumes, such as alfalfa, because slow permeability in the fragipan restricts root penetration and downward movement of water. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. Water-tolerant species are favored in timber stands. The equipment limitation, seedling mortality, and the windthrow hazard are major management concerns. The high water table restricts the use of equipment to midsummer, when the soil is dry, or to midwinter, when the soil is frozen or has a protective cover of snow. Using special planting stock and overstocking help to reduce seedling mortality. Harvesting without isolating the remaining trees or leaving them widely spaced helps to overcome the

windthrow hazard. Machine planting is practical in large areas.

Wetness and slow permeability in the fragipan are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses. Wetness, low strength, and frost action are severe limitations for local roads and streets.

The land capability classification is 3W. The woodland ordination symbol is 4W.

PbB—Penn loam, 0 to 8 percent slopes, very stony

This is a nearly level and gently sloping, moderately deep, well drained soil on ridges. Slopes are smooth or convex. Areas of this soil are elongated or long and narrow in shape and range from 5 to 100 acres in size. Stones and boulders ranging in size from 1 foot to more than 4 feet across cover about 1 to 3 percent of the surface.

Typically, the surface layer is dark reddish brown, friable loam about 3 inches thick. The subsurface layer is reddish brown, friable loam about 6 inches thick. The subsoil is about 21 inches thick. It is reddish brown, friable loam to a depth of about 14 inches; weak red, friable silt loam to a depth of about 24 inches; and weak red, firm channery silt loam to a depth of about 30 inches. The substratum to a depth of 38 inches is weak red, very firm very channery loam. Fractured weak red, sandstone bedrock is at a depth of about 38 inches. In some areas depth to bedrock is more than 40 inches.

Included with this soil in mapping are a few, scattered areas of shallow, somewhat excessively drained Klinesville soils on sides of ridges below the Penn soil. Also included are a few, small areas of deep, moderately well drained Readington soils and moderately deep Reaville soils on low rises and in depressions on lowlands. Klinesville soils have more sand and rock fragments throughout than the Penn soil. Readington and Reaville soils have gray mottles in the middle and lower parts of the subsoil. Also included are a few, nonstony, channery, extremely stony, and rubbly areas. Included areas make up about 15 percent of the map unit.

Permeability in this Penn soil is moderate or moderately rapid. Available water capacity is low or moderate. Surface runoff is medium. In unlimed areas this soil is extremely acid to strongly acid in the upper part of the solum, strongly acid or moderately acid in the lower part, and strongly acid to slightly acid in the substratum. Depth to bedrock restricts root penetration.

In most areas this soil is used for woodland. In some areas it is used for urban development.

This soil is unsuited to cultivated crops and fairly poorly suited to grasses and legumes for permanent pasture because of stones and boulders on the surface. Permanent stands of grasses and legumes help to reduce surface runoff and to control erosion.

Potential productivity for trees on this soil is moderate. Slope and stones and boulders restrict machine planting. Disturbing the ground cover as little as possible when the trees are harvested helps to control erosion.

Stones and boulders beneath the surface and depth to bedrock are severe limitations for onsite waste disposal. The soil is suitable as sites for dwellings without basements. Depth of bedrock is a moderate limitation for dwellings with basements. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 6S. The woodland ordination symbol is 3A.

PbD—Penn loam, 8 to 25 percent slopes, very stony

This is a strongly sloping and moderately steep, moderately deep, well drained soil on ridges and hills. Slopes are convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 1,000 acres in size. Stones and boulders ranging in size from 1 to more than 4 feet across cover about 1 to 3 percent of the surface.

Typically, the surface layer is dark reddish brown, friable loam about 3 inches thick. The subsurface layer is reddish brown, friable loam about 6 inches thick. The subsoil is about 21 inches thick. It is reddish brown, friable loam to a depth of about 14 inches; weak red, friable silt loam to a depth of about 24 inches; and weak red, firm channery silt loam to a depth of about 30 inches. The substratum to a depth of 38 inches is weak red, very firm very channery loam. Fractured weak red, sandstone bedrock is at a depth of about 38 inches. In some areas depth to bedrock is more than 40 inches.

Included with this soil in mapping are a few, scattered areas of shallow, somewhat excessively drained Klinesville soils on sides of ridges below the Penn soil. Also included are a few, small areas of deep, moderately well drained Readington soils and moderately deep Reaville soils on low rises and in depressions on lowlands. Klinesville soils have more sand and rock fragments throughout than the Penn soil. Readington and Reaville soils have gray mottles in the middle and lower parts of the subsoil. Also included are a few, nonstony, channery, extremely stony, and rubbly areas. Included areas make up about 15 percent of the map unit.

Permeability in this Penn soil is moderate or moderately rapid. Available water capacity is low or moderate. Surface runoff is rapid. In unlimed areas this soil is extremely acid to strongly acid in the upper part of the solum, strongly acid or moderately acid in the lower part, and strongly acid to slightly acid in the substratum. Depth to bedrock restricts root penetration.

In most areas this soil is used for woodland. In some areas it is used for urban development.

This soil is unsuited to cultivated crops and poorly suited to grasses and legumes for permanent pasture because of stones and boulders on the surface. Farm machinery operable on strongly sloping and moderately steep slopes is needed for seedbed preparation.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. Operating ordinary crawler tractors and rubber-tired skidders can be hazardous because of slope. Thinning or removing undesirable species is a suitable management practice. Slope and stones and boulders restrict machine planting. Disturbing the ground cover as little as possible when harvesting trees helps to control erosion.

Slope and stones and boulders beneath the surface are severe limitations for onsite waste disposal, dwellings, and local roads and streets.

The land capability classification is 6S. The woodland ordination symbol is 3R.

PcF—Penn channery loam, 25 to 50 percent slopes, very stony

This is a steep and very steep, moderately deep, well drained soil on ridges and hills. Slopes are convex. Areas of this soil are long and narrow in shape and range from 5 to 300 acres in size. Stones and boulders ranging in size from 1 foot to 4 feet cover about 1 to 3 percent of the surface.

Typically, the surface layer is dark reddish brown, friable channery loam about 3 inches thick. The subsurface layer is reddish brown, channery loam about 6 inches thick. The subsoil is about 21 inches thick. It is reddish brown, friable loam to a depth of about 14 inches; weak red, friable silt loam to a depth of about 24 inches; and weak red, firm channery silt loam to a depth of about 30 inches. The substratum to a depth of 38 inches is weak red, very firm very channery loam. Fractured, weak red, sandstone bedrock is at a depth of about 38 inches. In some areas depth to bedrock is more than 40 inches.

Included with this soil in mapping are a few, scattered areas of shallow, somewhat excessively drained Klinesville soils on sides of ridges below the Penn soil. Also included are a few, small areas of very deep Lewisberry soils and deep Lansdale soils on side slopes above the Penn soil. These soils contain more sand and rock fragments throughout than the Penn soil. Also included are a few, nonstony, channery, extremely stony, and rubbly areas. Included areas make up about 15 percent of the map unit.

Permeability in this Penn soil is moderate or moderately rapid. Available water capacity is low or moderate. Surface runoff is rapid or very rapid. In unlimed areas the soil is extremely acid to strongly acid in the upper part of the solum, strongly acid or moderately acid in the lower part, and strongly acid to slightly acid in the substratum. Depth to bedrock restricts root penetration.

In most areas this soil is used for woodland or idle land.

This soil is unsuited to cultivated crops and poorly suited to grasses and legumes for permanent pasture because of slope and stones and boulders on the surface. Machinery operable on steep and very steep slopes is needed for seedbed preparation. Permanent stands of grasses and legumes help to reduce surface runoff and to control erosion.

Potential productivity for trees on this soil is moderate. The equipment limitation is the main management concern. Ordinary crawler tractors and rubber-tired skidders cannot be operated safely on these slopes.

This soil is unsuited to sites for onsite waste disposal, dwellings, and local roads and streets because of slope and stones and boulders beneath the surface.

The land capability classification is 7S. The woodland ordination symbol is 3R.

PeB—Penn silt loam, 3 to 8 percent slopes

This is a gently sloping, moderately deep, well drained soil on undulating uplands. Slopes are smooth and convex. Areas of this soil are irregular in shape and range from 5 to 400 acres in size.

Typically, the surface layer is dark reddish brown, friable silt loam about 9 inches thick. The subsoil is about 21 inches thick. It is reddish brown, friable silt loam to a depth of about 14 inches; dusky red, firm silt loam to a depth of about 24 inches; and dusky red, firm channery silt loam to a depth of about 30 inches. The substratum to a depth of 38 inches is dusky red, very firm, very channery silt loam. Fractured, dusky red, siltstone bedrock is at a depth of about 38 inches. In some areas the soil is nearly level and strongly sloping or brown, yellowish brown, or strong brown throughout. In some areas depth to bedrock is less than 20 inches or more than 40 inches. In many areas

the surface layer is loam, channery loam, or channery silt loam.

Included with this soil in mapping are a few, scattered areas of shallow, somewhat excessively drained Klinesville soils on sides of ridges below the Penn soil. Also included are a few, small areas of deep, moderately well drained Readington soils and moderately deep Reaville soils on low rises and in depressions on lowlands. Klinesville soils have more sand and rock fragments throughout than the Penn soil. Readington and Reaville soils have gray mottles in the middle and lower parts of the subsoil. Also included are a few, nonstony, channery, extremely stony, and rubbly areas. Included areas make up about 15 percent of the map unit.

Permeability in this Penn soil is moderate or moderately rapid. Available water capacity is low or moderate. Surface runoff is medium. In unlimed areas this soil is extremely acid to strongly acid in the upper part of the solum, strongly acid or moderately acid in the lower part, and strongly acid to slightly acid in the substratum. Depth to bedrock restricts root penetration.

In most areas this soil is used for cropland or pasture. In some areas it is used for orchards or woodland. In a few, small areas it is used for urban development.

This soil is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping (fig. 16), and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderate. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock is a severe limitation for onsite waste disposal. The soil is suitable as sites for dwellings without basements. Moderate permeability is a moderate limitation for dwellings with basements and most other urban uses. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 3A.

Figure 16.—Contour stripcropping helps to reduce runoff and to control erosion on Penn silt loam, 3 to 8 percent slopes. An area of Penn-Klinesville channery silt loams, 8 to 15 percent slopes, is on the left in the background.

PeC—Penn silt loam, 8 to 15 percent slopes

This is a strongly sloping, moderately deep, well drained soil on broad ridgetops and side slopes. Slopes are smooth or convex. Areas of this soil are irregular or long and narrow in shape and range from 5 to 200 acres in size.

Typically, the surface layer is dark reddish brown, friable silt loam about 9 inches thick. The subsoil is about 21 inches thick. It is reddish brown, friable silt loam to a depth of about 14 inches; dusky red, firm silt loam to a depth of about 24 inches; and dusky red, firm channery silt loam to a depth of about 30 inches. The substratum to a depth of 38 inches is dusky red, very firm, very channery silt loam. Fractured, dusky red, siltstone bedrock is at a depth of about 38 inches. In some areas the soil is nearly level and strongly sloping or brown, yellowish brown, or strong brown throughout. In some areas depth to bedrock is less than 20 inches or more than 40 inches. In many areas the surface layer is loam, channery loam, or channery silt loam.

Included with this soil in mapping are a few, scattered areas of shallow, somewhat excessively drained Klinesville soils on sides of ridges below the Penn soil. Also included are a few, small areas of deep, moderately well drained Readington soils and moderately deep Reaville soils on low rises and in depressions on lowlands. Klinesville soils contain more sand and rock fragments throughout than the Penn soil. Readington and Reaville soils have gray mottles in the middle and lower parts of the subsoil. Also included are a few, nonstony, channery, extremely stony, and rubbly areas. Included areas make up about 15 percent of the map unit.

Permeability in this Penn soil is moderate or moderately rapid. Available water capacity is low or moderate. Surface runoff is rapid. In unlimed areas this soil is extremely acid to strongly acid in the upper part of the solum, strongly acid or moderately acid in the lower part, and strongly acid to slightly acid in the substratum. Depth to bedrock restricts root penetration.

In most areas this soil is used for cropland or pasture. In some areas it is used for orchards or woodland. In a few areas it is used for urban development.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping system that includes grasses and legumes, a system of conservation tillage that leaves protective amounts of crop residue on the surface, diversions, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain the organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderate. No major hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock and slope are severe limitations for onsite waste disposal. Depth to bedrock and slope are moderate limitations for dwellings and most other urban uses. Slope and frost action are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 3A.

PoB—Penn-Klinesville channery silt loams, 3 to 8 percent slopes

This map unit consists of the gently sloping, moderately deep, well drained Penn soil and the shallow, somewhat excessively drained Klinesville soil on undulating ridgetops on uplands. Slopes are smooth or convex. Areas of these soils are irregular or long and narrow in shape and range from 5 to 200 acres in size. This map unit is about 50 percent Penn soil, 40 percent Klinesville soil, and 10 percent included soils. These soils are in areas so intricately mixed or so small in size that separating them in mapping was not practical.

Typically, the Penn soil has a surface layer of dark reddish brown, friable channery silt loam about 9 inches thick. The subsoil is about 21 inches thick. It is reddish brown, friable silt loam to a depth of about 14 inches; dusky red, firm silt loam to a depth of about 24 inches; and dusky red, firm, channery silt loam to a depth of about 30 inches. The substratum to a depth of 38 inches is dusky red, very firm, very channery silt loam. Fractured, dusky red siltstone bedrock is at a depth of 38 inches. In some areas the soils are nearly level and strongly sloping or brown, yellowish brown, or strong brown throughout. In some areas depth to

bedrock is less than 20 inches. In a few areas the surface layer is silt loam, loam, channery loam, or very channery silt loam or the soils are sandy loam throughout.

Typically, the Klinesville soil has a surface layer of reddish brown, very friable channery silt loam about 8 inches thick. The subsoil is red, friable, very channery silt loam about 6 inches thick. The substratum to a depth of 16 inches is dark red, firm, extremely channery silt loam. Fractured, weak red shale bedrock is at a depth of about 16 inches. In some areas the soils are nearly level and strongly sloping sandy loam throughout or are brown, yellowish brown, or strong brown throughout.

Included with these soils in mapping are a few, scattered areas of very deep Lewisberry soils and deep Lansdale soils on side slopes above the Penn soil. These soils have more sand and rock fragments throughout than the Penn and Klinesville soils. Included soils make up about 10 percent of the map unit.

Permeability is moderate or moderately rapid in the Penn soil and moderately rapid in the Klinesville soil. Available water capacity is low or moderate in the Penn soil and very low in the Klinesville soil. Surface runoff is medium. In unlimed areas the Penn soil is extremely acid to strongly acid in the upper part of the solum, strongly acid or moderately acid in the lower part, and strongly acid to slightly acid in the substratum. In unlimed areas the Klinesville soil is very strongly acid to moderately acid. In both soils depth to bedrock restricts root penetration.

In most areas these soils are used for cropland, pasture, or woodland. In some areas they are used for urban development or are idle land.

These soils are well suited to most specialty crops. They are fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard, and low or very low available water capacity during low rainfall is a limitation. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, terraces, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

These soils are well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on these soils is moderate. The main management concern is seedling mortality. Using special planting stock and harvesting while leaving mature trees to provide shade and protection help to reduce seedling mortality. Machine planting is practical in large areas.

Depth to bedrock is a severe limitation for onsite waste disposal. The Penn soil is suitable for dwellings without basements. On the Penn soil depth to bedrock is a moderate limitation for dwellings with basements and most other urban uses. On the Klinesville soil depth to bedrock is a moderate limitation for dwellings without basements and a severe limitation for dwellings with basements. On both soils frost action is a moderate limitation for local roads and streets.

The land capability classification is 2E for the Penn soil and 3E for the Klinesville soil. The woodland ordination symbol is 3A on the Penn soil and 3D on the Klinesville soil.

PoC—Penn-Klinesville channery silt loams, 8 to 15 percent slopes

This map unit consists of strongly sloping, moderately deep, well drained Penn soil and shallow, somewhat excessively drained Klinesville soil on ridgetops and side slopes. Slopes are smooth or convex. Areas are irregular or long and narrow in shape and range from 5 to 200 acres in size. This map unit is about 50 percent Penn soil, 40 percent Klinesville soil, and 10 percent included soils. The two soils occur as areas so intricately mixed or so small in size that separating them in mapping was not practical.

Typically, the Penn soil has a surface layer of dark reddish brown, friable channery silt loam about 9 inches thick. The subsoil is about 21 inches thick. It is reddish brown, friable silt loam to a depth of 14 inches; dusky red, firm silt loam to a depth of 24 inches; and dusky red, firm, channery silt loam to a depth of 30 inches. The substratum to a depth of 38 inches is dusky red, very firm, very channery silt loam. Fractured, dusky red siltstone bedrock is at a depth of 38 inches. In some areas the soils are gently sloping and moderately steep or steep. In some areas depth to bedrock is less than 20 inches. In a few areas the surface layer is silt loam, loam, channery loam, or very

channery silt loam, or the soils are sandy loam throughout. In some areas the soils are brown, yellowish brown, or strong brown throughout.

Typically, the Klinesville soil has a surface layer of reddish brown, very friable channery silt loam about 8 inches thick. The subsoil is red, friable, very channery silt loam about 6 inches thick. The substratum to a depth of 16 inches is dark red, firm, extremely channery silt loam. Fractured, weak red shale bedrock is at a depth of about 16 inches. In some areas the soils are gently sloping and moderately steep or steep. In some areas the soils are sandy loam throughout or brown, yellowish brown, or strong brown throughout. In a few areas depth to bedrock is less than 10 inches.

Included with these soils in mapping are a few, scattered areas of very deep Lewisberry soils and deep Lansdale soils on side slopes above the Penn soil. These soils have more sand and rock fragments throughout than the Penn and Klinesville soils. Included soils make up about 10 percent of the map unit.

Permeability is moderate or moderately rapid in the Penn soil and moderately rapid in the Klinesville soil. Available water capacity is low or moderate in the Penn soil and very low in the Klinesville soil. Surface runoff is medium on both soils. In unlimed areas the Penn soil is extremely acid to strongly acid in the upper part of the solum, strongly acid or moderately acid in the lower part of the solum, and strongly acid to slightly acid in the substratum. In unlimed areas the Klinesville soil is very strongly acid to moderately acid. On both soils depth to bedrock restricts root penetration.

In most areas these soils are used for cropland, pasture, or woodland. In some areas they are used for urban development or are idle land.

These soils are fairly well suited to most specialty crops. They are fairly suited to corn, soybeans, and small grain. Erosion is the main hazard. A limitation is the low or very low available water capacity during periods of low rainfall. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, terraces, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

These soils are well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on these soils is moderate. The main management concern is seedling mortality. Using special planting stock and harvesting while leaving some mature trees to provide shade and protection help to reduce seedling mortality. Machine planting is practical in large areas.

Depth to bedrock and slope are severe limitations for onsite waste disposal. On the Penn soil slope is a moderate limitation for dwellings. On the Klinesville soil slope and depth to bedrock are moderate limitations for dwellings. Slope and frost action are moderate limitations for local roads and streets.

The land capability classification is 3E for the Penn soil and 4E for the Klinesville soil. The woodland ordination symbol is 3A on the Penn soil and 3D on the Klinesville soil.

PpB—Penn-Lansdale complex, 3 to 8 percent slopes

This map unit consists of gently sloping, well drained Penn and Lansdale soils on undulating ridgetops on uplands. The Penn soil is moderately deep, and the Lansdale soil is deep. Slopes are smooth or convex. Areas of these soils are irregular or long and narrow in shape and range from 5 to 200 acres in size. This map unit is about 50 percent Penn soil, 40 percent Lansdale soil, and 10 percent included soils. The Penn and Lansdale soils are in areas so intricately mixed or so small in size that separating them in mapping was not practical.

Typically, the Penn soil has a surface layer of dark reddish brown, friable channery silt loam about 9 inches thick. The subsoil is about 21 inches thick. It is reddish brown, friable silt loam to a depth of 14 inches; dusky red, firm silt loam to a depth of 24 inches; and dusky red, firm, channery silt loam to a depth of 30 inches. The substratum to a depth of 38 inches is dusky red, very firm, very channery silt loam. Fractured, dusky red siltstone bedrock is at a depth of 38 inches. In some areas the soil is nearly level and strongly sloping. In some areas depth to bedrock is less than 20 inches. In a few areas the surface layer is silt loam, loam, channery loam, and very channery silt loam or the soil is sandy loam throughout. In some areas the soil is brown, yellowish brown, or strong brown throughout.

Typically, the Lansdale soil has a surface layer of dark brown, friable channery loam about 10 inches thick. The subsoil is about 20 inches thick. It is dark yellowish brown, friable loam to a depth of 17 inches and yellowish brown, friable and very friable sandy loam to a depth of 30 inches. The substratum to a depth of 47 inches is yellowish brown, very friable loamy sand and loose channery loamy sand. Fractured, dark grayish brown sandstone bedrock is at a depth of about 47 inches. In some areas the soil is nearly level and strongly sloping. In some areas the surface layer is silt loam or the soil is silt loam throughout. In a few areas the lower part of the subsoil and the substratum are dusky red. In some areas depth to bedrock is less than 40 inches or more than 60 inches.

Included with these soils in mapping are a few, scattered areas of very deep, Lewisberry soils on side slopes above the Penn soil. The included soils have more sand and rock fragments throughout than the Penn soil. Included soils make up about 10 percent of the map unit.

Permeability is moderate or moderately rapid in the Penn soil. In the Lansdale soil it is moderate in the surface layer, moderate or moderately rapid in the subsoil, and moderately rapid in the substratum. On both soils available water capacity is low or moderate. On both soils surface runoff is medium. In unlimed areas the Penn soil is extremely acid to strongly acid in the upper part of the solum, strongly acid or moderately acid in the lower part of the solum, and strongly acid to slightly acid in the substratum. In unlimed areas the Lansdale soil is very strongly acid throughout. On both soils depth to bedrock restricts root penetration.

In most areas these soils are used for cropland or pasture. In some areas they are used as orchards or woodland or are idle land. In a few areas they are used for urban development.

These soils are well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. The low or moderate available water capacity is a limitation during periods of low rainfall. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, terraces, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

These soils are well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to keep the pasture and the soils in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on these soils is moderate on the Penn soil and moderately high on the Lansdale soil. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock is a severe limitation for onsite waste disposal. These soils are suitable as sites for dwellings without basements. Depth to bedrock is a moderate limitation for dwellings with basements and most other urban uses. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 2E for the Penn and Lansdale soils. The woodland ordination symbol is 3A on the Penn soil and 4A on the Lansdale soil.

PpC—Penn-Lansdale complex, 8 to 15 percent slopes

This map unit consists of strongly sloping, well drained Penn and Lansdale soils on ridgetops and side slopes on highly dissected uplands. The Penn soil is moderately deep, and the Lansdale soil is deep. Slopes are smooth or convex. Areas of these soils are irregular or long and narrow in shape and range from 5 to 200 acres in size. This map unit is about 50 percent Penn soil, 40 percent Lansdale soil, and 10 percent included soils. The two soils are in areas so intricately mixed or so small in size that separating them in mapping was not practical.

Typically, the Penn soil has a surface layer of dark reddish brown, friable channery silt loam about 9 inches thick. The subsoil is about 21 inches thick. It is reddish brown, friable silt loam to a depth of 14 inches; dusky red, firm silt loam to a depth of 24 inches; and dusky red, firm, channery silt loam to a depth of 30 inches. The substratum to a depth of 38 inches is dusky red, very firm, very channery silt loam. Fractured, dusky red siltstone bedrock is at a depth of 38 inches. In some areas the soil is gently sloping and moderately steep or steep. In some areas depth to bedrock is less than 20 inches. In a few areas the surface layer is silt loam, loam, channery loam, or very channery silt loam or the soil is sandy loam throughout. In some areas the soil is brown, yellowish brown, or strong brown throughout.

Typically, the Lansdale soil has a surface layer of dark brown, friable channery loam about 10 inches thick. The subsoil is about 20 inches thick. It is dark yellowish brown, friable loam to a depth of 17 inches and yellowish brown, friable and very friable sandy loam to a depth of 30 inches. The substratum to a depth of 47 inches is yellowish brown, very friable loamy sand and loose channery loamy sand. Fractured, dark grayish brown sandstone bedrock is at a depth of about 47 inches. In some areas the soil is gently sloping and moderately steep. In some areas the surface layer is silt loam or silt loam throughout. In a few areas the lower part of the subsoil and the substratum are dusky red. In some areas depth to bedrock is less than 40 inches or more than 60 inches.

Included with these soils in mapping are a few, scattered areas of very deep, Lewisberry soils on side slopes above the Penn soil. Lewisberry soils have more sand and rock fragments throughout than the Penn soil. Included soils make up about 10 percent of the map unit.

Permeability is moderate or moderately rapid in the Penn soil. In the Lansdale soil it is moderate in the surface layer, moderate or moderately rapid in the subsoil, and moderately rapid in the substratum. On both soils available water capacity is low or moderate. On both soils surface runoff is medium. In unlimed areas the Penn soil is extremely acid to strongly acid in the upper part of the solum, strongly acid or moderately acid in the lower part of the solum, and strongly acid to slightly acid in the substratum. The Lansdale soil is very strongly acid throughout. On both soils depth to bedrock restricts root penetration.

In most areas these soils are used for cropland or pasture. In some areas they are used as orchards or woodland or are idle land. A few areas are used for urban development.

These soils are well suited to most specialty crops. They are fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Low or moderate available water capacity during periods of low rainfall is a limitation. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, terraces, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

These soils are well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees is moderate on the Penn soil and moderately high on the Lansdale soil. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock and slope are severe limitations for onsite waste disposal. Slope is a moderate limitation for dwellings without basements. Slope and depth to bedrock are moderate limitations for dwellings with basements. Slope and frost action are moderate limitations for local roads and streets.

The land capability classification is 3E for both soils. The woodland ordination symbol is 3A on the Penn soil and 4A on the Lansdale soil.

PsB—Pequea silt loam, 3 to 8 percent slopes

This is a gently sloping, deep, well drained soil on ridgetops. Slopes are smooth or concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, very friable silt loam about 8 inches thick. The subsoil is brown, friable silt loam about 16 inches thick. The substratum extends to a depth of 59 inches. It is brown and very dark grayish brown, friable, very micaceous channery loam to a depth of 40 inches and very dark grayish brown, friable, very micaceous channery sandy loam to a depth of 59 inches. The very dark gray micaceous schist bedrock is at a depth of 59 inches. In some areas the soil is nearly level and strongly sloping. In some areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas where a few, large rock fragments are on or below the surface. Included areas make up about 10 percent of the map unit.

Permeability in this Pequea soil is moderate or moderately rapid. Available water capacity is moderate or low. Surface runoff is medium. In unlimed areas the soil is slightly acid or neutral in the solum and neutral to moderately alkaline in the substratum.

In most areas this soil is used for cropland or pasture. In some areas it is used for urban development.

It is well suited to corn, soybeans, small grain, and most specialty crops. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No hazards or limitations affect use and management. Machine planting is practical in large areas.

Depth to bedrock is a moderate limitation for onsite waste disposal and dwellings with basements. The soil is suitable as sites for dwellings without basements. Frost action is a moderate limitation for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

PsC—Pequea silt loam, 8 to 15 percent slopes

This is a strongly sloping, deep, well drained soil on ridgetops and side slopes. Slopes are concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, very friable silt loam about 8 inches thick. The subsoil is brown, friable silt loam about 16 inches thick. The substratum extends to a depth of 59 inches. It is brown and very dark grayish brown, friable, very micaceous channery loam to a depth of 40 inches and very dark grayish brown, friable, very micaceous channery sandy loam to a depth of 59 inches. Very dark gray, micaceous schist bedrock is at a depth of 59 inches. In some areas the soil is gently sloping and moderately steep. In some areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas where a few, large rock fragments are on or below the surface. Included areas make up about 10 percent of the map unit.

Permeability in this Pequea soil is moderate or moderately rapid. Available water capacity is moderate or low. Surface runoff is medium. In unlimed areas this soil is slightly acid or neutral in the solum and neutral to moderately alkaline in the substratum.

In most areas this soil is used for cropland or pasture. In some areas it is used for woodland or is idle land. In a few areas it is used for urban development.

This soil is well suited to most specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. Erosion hazard is the main management concern. A gentle grade is needed for logging roads, skid trails, and landings, and water bars, culverts, and drop structures are needed to remove water. Machine planting is practical in large areas.

Depth to bedrock and slope are moderate limitations for onsite waste disposal and dwellings with basements. Slope is a moderate limitation for dwellings without basements. Slope and frost action are severe limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4R.

PsD—Pequea silt loam, 15 to 25 percent slopes

This is a moderately sloping, deep, well drained soil on ridges and hills. Slopes are concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark brown, very friable silt loam about 8 inches thick. The subsoil is brown, friable silt loam about 16 inches thick. The substratum extends to a depth of 59 inches. It is brown and very dark grayish brown, friable, very micaceous channery loam to a depth of 40 inches and very dark grayish brown, friable, very micaceous channery sandy loam to a depth of 59 inches. Very dark gray, micaceous schist bedrock is at a depth of 59 inches. In some areas the soil is strongly sloping and steep or very steep. In some areas depth to bedrock is less than 40 inches.

Included with this soil in mapping are a few, small, scattered areas where a few, large rock fragments are on or below the surface. Included areas make up about 10 percent of the map unit.

Permeability in the Pequea soil is moderate or moderately rapid. Available water capacity is moderate or low. Surface runoff is medium. In unlimed areas this soil is slightly acid or neutral in the solum and neutral to moderately alkaline in the substratum.

In most areas this soil is used for pasture or woodland or is idle land. In a few areas it is used for cropland.

This soil is fairly well suited to most specialty crops. It is poorly suited to corn, soybeans, and small grain. Erosion is the main hazard. Conservation management practices are needed to reduce surface runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, stripcropping, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. Erosion hazard and equipment limitation are major management concerns. Because of erosion hazard, a gentle grade is needed for logging roads, skid trails, and landings and water bars, culverts, and drop structures are needed to remove water. Special logging methods, such as yarding logs uphill with cable, are needed to minimize the use of rubber-tired skidders and crawler tractors. Ordinary crawler tractors and rubber-tired skidders cannot be operated safely on these slopes. Machine planting is practical in large areas.

Slope is a severe limitation for onsite waste disposal, dwellings, most other urban uses, and local roads and streets.

The land capability classification is 4E. The woodland ordination symbol is 4R.

Pt—Pits, quarries

This map unit consists of nearly level to very steep, miscellaneous areas where bedrock has been removed for use as construction material. Areas of Pits, quarries, are 5 to 300 acres in size.

A typical area consists of exposed bedrock of limestone, slate, greenstone, quartzite, phyllite, shale, or sandstone and thin to thick layers of sand and gravel or soil material (fig. 17).

Included with this unit in mapping are small areas of rubble, spoil, commercial, industrial, and residential waste near edges of pits. Also included, near the center of pits, are small areas of water. Included areas make up about 20 percent of the map unit.

Permeability of Pits, quarries, available water capacity, runoff, reaction, and depth to bedrock are variable.

Most pits are being mined. Areas of exposed bedrock and water support no vegetation. Pine seedlings and selected hardwood species can be established on spoil banks that have a sufficient amount of soil material mixed with flaggy, channery, and shaly rock fragments.

Onsite investigation is needed if miscellaneous areas are to be used as building sites.

This map unit has been assigned neither a land capability classification nor a woodland ordination symbol.

RaA—Raritan silt loam, 0 to 3 percent slopes

This is a nearly level, very deep, moderately well drained soil on terraces and benches above flood plains of larger streams. Slopes are smooth or concave.

Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 9 inches thick. The subsoil is about 45 inches thick. It is strong brown and yellowish red, friable silt loam to a depth of 20 inches; yellowish red, mottled, firm silty clay loam to a depth of 26 inches; strong brown, mottled, very firm and brittle clay loam to a depth of 36 inches; brown and reddish brown, mottled, very firm and brittle silty clay loam to a depth of 48 inches; and brown, mottled, firm clay loam to a depth of 54 inches. The substratum to a depth of 60 inches is reddish brown, mottled, friable stratified gravelly loam and gravelly clay loam. In some areas the soil is gently sloping. In some areas the subsoil is yellowish brown. In a few areas the surface layer is loam and sandy loam. In some areas the soil does not have gray mottles in the upper part of the subsoil or does not have a fragipan. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, scattered areas of very deep, well drained Birdsboro soils on large flats of stream terraces and on benches above the Raritan soil. Also included are a few, small areas of poorly drained Croton and Lamington soils in shallow depressions and along narrow drainageways on lowlands. Croton and Lamington soils are grayish throughout. Also included are some small areas of very deep, moderately well drained Rowland soils on low rises of bottom lands. Included soils make up about 15 percent of the map unit.

Permeability in this Raritan soil is moderate above the fragipan, moderately slow in the fragipan, and moderate or moderately rapid in the substratum. Available water capacity is moderate. Surface runoff is slow. The fragipan is at a depth of 20 to 30 inches. The seasonal high water table is at a depth of 18 to 36 inches. In unlimed areas this soil is very strongly acid to moderately acid throughout. The fragipan and the seasonal high water table restrict root penetration.

In most areas this soil is used for cropland or pasture. In a few, small areas it is used for woodland or is idle land.

This soil is well suited to corn, soybeans, small grain, and most speciality crops. The main limitations are the seasonal high water table and the moderately slow permeability in the fragipan. During periods when rainfall is below normal or poorly distributed, drought can damage crops. Existing, well maintained drainage systems help to overcome wetness. Leaving stubble on the surface and adding other organic material conserves moisture. Crop residue management, cover crops, and green manure crops help to maintain the organic matter content and to improve soil tilth.

This soil is well suited to pasture. It is poorly suited to deep-rooted legumes, such as alfalfa, however, because moderately slow permeability in the fragipan restricts root penetration and downward movement of water. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. Equipment should be operated

Figure 17.—This area of Pits, quarries, comprises the pile of soil material, rock fragments, and stones and boulders removed from a limestone quarry. In the foreground is an area of Duffield silt loam, 8 to 15 percent slopes.

only when the soil is relatively dry or frozen. Machine planting is practical in large areas.

Wetness and moderately slow permeability are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses and local roads and streets.

The land capability classification is 2W. The woodland ordination symbol is 4A.

RaB—Raritan silt loam, 3 to 8 percent slopes

This is a gently sloping, very deep, moderately well drained soil on terraces and benches above flood plains of larger streams. Slopes are smooth or concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 9 inches thick. The subsoil is about 45 inches thick. It is strong brown and yellowish red, friable silt loam to a depth of 20 inches; yellowish red, mottled, firm silty clay loam to a depth of 26 inches; strong brown, mottled, very firm and brittle clay loam to a depth of 36 inches; brown and reddish brown, mottled, very firm and brittle silty clay loam to a depth of 48 inches; and brown, mottled, firm clay loam to a depth of 54 inches. The substratum to a depth of 60 inches is reddish brown, mottled, stratified, friable gravelly loam and gravelly clay loam. In some areas the soil is nearly level and strongly sloping. In some areas the subsoil is yellowish brown. In a few areas the surface layer is loam or sandy loam. In some areas the soil has neither gray mottles in the upper part of the subsoil nor a fragipan. In some areas depth to bedrock is less than 60 inches.

Included with this soil in mapping are a few, scattered areas of very deep, well drained Birdsboro soils on large flats of stream terraces and on benches above the Raritan soil. Also included are a few, small areas of poorly drained Croton and Lamington soils in shallow depressions and along narrow drainageways on lowlands. Croton and Lamington soils are grayish throughout. Also included are some small areas of very deep, moderately well drained Rowland soils on low rises on bottom lands. Included soils make up about 15 percent of the map unit.

Permeability in this Raritan soil is moderate above the fragipan, moderately slow in the fragipan, and moderate or moderately rapid in the substratum. Available water capacity is moderate. Surface runoff is medium. The fragipan is at a depth of 20 to 30 inches. The seasonal high water table is at a depth of 18 to 36 inches. In unlimed areas this soil is very strongly acid to moderately acid throughout. The fragipan and the seasonal high water table restrict root penetration.

In most areas this soil is used for cropland or pasture. In some areas it is used for woodland or urban development.

It is well suited to corn, soybeans, small grain, and most speciality crops. Erosion is the major concern. The moderately slow permeability in the fragipan and the seasonal high water table are limitations. During periods when rainfall is below normal or poorly distributed, drought can damage crops. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, and grassed waterways. Existing, well maintained drainage systems help to overcome wetness. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation is the main management concern. Equipment should be operated only when the soil is relatively dry or frozen. Machine planting is practical in large areas.

Wetness and moderately slow permeability are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings, most other urban uses, and local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

ReA—Readington silt loam, 0 to 3 percent slopes

This is a nearly level, deep, moderately well drained soil on broad uplands and in depressions. Slopes are smooth or concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark reddish gray,

friable silt loam about 10 inches thick. The subsoil is about 30 inches thick. It is reddish brown, friable silt loam to a depth of 25 inches; reddish brown, mottled, friable silt loam to a depth of 27 inches; and weak red, mottled, very firm and brittle channery silt loam and very channery silt loam to a depth of 40 inches. The substratum to a depth of 46 inches is weak red, mottled, very firm extremely channery silt loam. Weak red, fractured siltstone bedrock is at a depth of 46 inches. In some areas the soil is gently sloping. In some areas the subsoil is yellowish brown. In a few areas the surface layer is loam and sandy loam. In a few areas depth to bedrock is less than 40 inches or more than 60 inches.

Included with this soil in mapping are a few, scattered areas of well drained Athol and Penn soils on broad, undulating ridgetops. Also included are a few, small areas of deep, poorly drained Croton soils in shallow depressions and along narrow drainageways on lowlands. Included soils make up about 15 percent of the map unit.

Permeability in this Readington soil is moderate in the upper part of the solum and moderately slow in the fragipan and the substratum. Available water capacity is moderate. Surface runoff is slow. The fragipan is at a depth of 20 to 36 inches. The seasonal high water table is at a depth of 18 to 36 inches. In unlimed areas this soil is extremely acid to slightly acid in the upper part of the solum and strongly acid to slightly acid in the lower part and in the substratum. The fragipan and the seasonal high water table restrict root penetration.

In most areas this soil is used for cropland or pasture. In a few, small areas it is used for woodland or urban development.

It is well suited to corn, soybeans, small grain, and most speciality crops. The main limitations are wetness and moderately slow permeability in the fragipan. During periods when rainfall is below normal or poorly distributed, drought can damage crops. Existing, well maintained drainage systems help to overcome wetness. Leaving stubble on the surface and adding other organic material help to conserve moisture. Crop residue management, cover crops, and green manure crops help to maintain organic matter content and to improve soil tilth.

This soil is well suited to pasture. It is poorly suited to deep-rooted legumes, such as alfalfa, however, because moderately slowly permeability in the fragipan restricts root penetration and downward movement of water. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No limitations or hazards affect use and management. Machine planting is practical in large areas.

Wetness and moderately slow permeability are severe limitations for onsite waste disposal. Wetness is a moderate limitation for dwellings without basements and a severe limitation for dwellings with basements and most other urban uses. Wetness, low strength, and frost action are moderate limitations for local roads and streets.

The land capability classification is 2W. The woodland ordination symbol is 4A.

ReB—Readington silt loam, 3 to 8 percent slopes

This is a gently sloping, deep, moderately well drained soil on broad uplands and in depressions. Slopes are smooth or concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark reddish gray, friable silt loam about 10 inches thick. The subsoil is about 30 inches thick. It is reddish brown, friable silt loam to a depth of 25 inches; reddish brown, mottled, friable silt loam to a depth of 27 inches; and weak red, mottled, very firm and brittle channery silt loam and very channery silt loam to a depth of 40 inches. The substratum to a depth of 46 inches is weak red, mottled, very firm extremely channery silt loam. Weak red, fractured siltstone bedrock is at a depth of 46 inches. In some areas the soil is nearly level and strongly sloping. In some areas the subsoil is yellowish brown. In a few areas the surface layer is loam or sandy loam. In some areas the soil does not have a fragipan. In a few areas depth to bedrock is less than 40 inches or more than 60 inches.

Included with this soil in mapping are a few, scattered areas of well drained Athol and Penn soils on broad, undulating ridgetops. Also included are a few, small areas of deep, poorly drained Croton soils in shallow depressions and along narrow drainageways on lowlands. Included soils make up about 15 percent of the map unit.

Permeability in this Readington soil is moderate in the upper part of the solum and moderately slow in the

fragipan and in the substratum. Available water capacity is moderate. Surface runoff is medium. The fragipan is at a depth of 20 to 36 inches. The seasonal high water table is at a depth of 18 to 36 inches. In unlimed areas this soil is extremely acid to slightly acid in the upper part of the solum and strongly acid to slightly acid in the lower part and in the substratum. The fragipan and the seasonal high water table restrict root penetration.

In most areas this soil is used for cropland or pasture. In some areas it is used for woodland or urban development.

This soil is well suited to corn, soybeans, small grain, and most speciality crops. Erosion is the major hazard. Wetness and moderately slowly permeable fragipan are limitations. During periods when rainfall is below normal or is poorly distributed, drought can damage crops. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, and grassed waterways. Existing, well maintained drainage systems help to overcome wetness. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. No limitations or hazards affect use and management. Machine planting is practical in large areas.

Wetness and moderately slow permeability are severe limitations for onsite waste disposal. Wetness is a moderate limitation for dwellings without basements and a severe limitation for dwellings with basements and most other urban uses. Wetness, low strength, and frost action are moderate limitations for local roads and streets.

The land capability classification is 2E. The woodland ordination symbol is 4A.

RfB—Reaville channery silt loam, 3 to 8 percent slopes

This is a gently sloping, moderately deep, moderately well drained soil on ridgetops and in depressions. Slopes are smooth, convex, or concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is reddish brown, friable channery silt loam about 9 inches thick. The subsoil is reddish brown, mottled, friable and firm channery silt loam about 6 inches thick. The substratum to a depth of 25 inches is dusky red, mottled, firm very channery silt loam. Weak, red shale and siltstone bedrock is at a depth of 25 inches. In some areas the soil is nearly level and strongly sloping. In some areas the subsoil is yellowish brown. In a few areas the soil has a weak fragipan. In some areas depth to bedrock is less than 20 inches or more than 40 inches.

Included with this soil in mapping are a few, scattered areas of somewhat excessively drained Klinesville soils on knobs and along tops and sides of ridges. Also included are a few, small areas of Penn soils on broad, undulating ridgetops and a few areas of deep, poorly drained Croton soils in shallow depressions and along narrow drainageways on lowlands. Also included are small areas of somewhat poorly drained Lehigh soils on slightly higher rises above the Reaville soil. Also included are some small areas where rock fragments are neither on the surface nor in the soil. Included areas make up about 15 percent of the map unit.

Permeability in this Reaville soil is moderate in the surface layer and slow in the subsoil and in the substratum. Available water capacity is low or very low. Surface runoff is medium. The seasonal high water table is at a depth of 16 to 36 inches. In unlimed areas this soil is strongly acid to slightly acid throughout. Depth to bedrock and the seasonal high water table restrict root penetration.

In most areas this soil is used for cropland or pasture. In some areas it is used for woodland or urban development.

This soil is well suited to corn, soybeans, small grain, and most speciality crops. Erosion is a major hazard. Wetness is the main limitation. During periods when rainfall is below normal or is poorly distributed, drought can damage crops. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective

amounts of crop residue on the surface, contour farming, and grassed waterways. Existing, well maintained drainage systems help to overcome wetness. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation and the windthrow hazard are major management concerns. When the soil is wet, the logging roads become slippery and quickly rutted. Use of planting or logging equipment is limited during wet periods. Because of erosion hazard, a gentle grade is needed for logging roads, skid trails, and landings, and water bars, an out-sloping road surface, culverts, and drop structures are needed to remove water. In some areas replanting of seedlings is needed. Harvesting without isolating the remaining trees or leaving them widely spaced helps to prevent windthrow. Machine planting is practical in large areas.

Depth to bedrock, wetness, and slow permeability are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings without basements. Wetness and depth to bedrock are severe limitations for dwellings with basements and most other urban uses. Frost action is a severe limitation for local roads and streets.

The land capability classification is 3W. The woodland ordination symbol is 4W.

RfC—Reaville channery silt loam, 8 to 15 percent slopes

This is a strongly sloping, moderately deep, moderately well drained soil on ridgetops and in depressions. Slopes are smooth, convex, or concave. Areas of this soil are irregular or long and narrow in shape and range from 5 to 25 acres in size.

Typically, the surface layer is reddish brown, friable channery silt loam about 9 inches thick. The subsoil is reddish brown, mottled, friable and firm channery silt loam about 6 inches thick. The substratum to a depth of 25 inches is dusky red, mottled, firm very channery silt loam. Weak red shale and siltstone bedrock is at a depth of 25 inches. In some areas the soil is gently sloping and moderately steep or has a weak fragipan. In some areas the subsoil is yellowish brown or depth to bedrock is less than 20 inches or more than 40 inches.

Included with this soil in mapping are a few, scattered areas of somewhat excessively drained Klinesville soils on knobs and along tops and sides of ridges. Also included are a few, small areas of Penn soils on broad, undulating ridgetops and a few areas of deep, poorly drained Croton soils in shallow depressions and along narrow drainageways on lowlands. Also included are small areas of somewhat poorly drained Lehigh soils on slightly higher rises above the Reaville soil. Also included are some small areas where no rock fragments are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability in this Reaville soil is moderate in the surface layer and slow in the subsoil and in the substratum. Available water capacity is low or very low. Surface runoff is rapid. The seasonal high water table is at a depth of 16 to 36 inches. In unlimed areas this soil is strongly acid to slightly acid throughout. Depth to bedrock and the seasonal high water table restrict root penetration.

In most areas this soil is used for cropland or pasture. In some areas it is used for woodland or urban development.

This soil is well suited to specialty crops. It is fairly well suited to corn, soybeans, and small grain. Erosion is the major hazard. Wetness is the main limitation. During periods when rainfall is below normal or poorly distributed, drought can damage crops. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, diversions, contour farming, and grassed waterways. Existing, well maintained drainage systems help to overcome wetness. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to

maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation and the windthrow hazard are major management concerns. When the soil is wet, the logging roads become slippery and quickly rutted. Use of planting or logging equipment is limited during wet periods. Because of erosion hazard, a gentle grade is needed for logging roads, skid trails, and landings, and water bars, an out-sloping road surface, culverts, and drop structures are needed to remove water. Some replanting of seedlings may be needed. Harvesting without isolating the remaining trees or leaving them widely spaced helps to prevent windthrow. Machine planting is practical in large areas.

Depth to bedrock, wetness, and slow permeability are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings without basements. Wetness and depth to bedrock are severe limitations for dwellings with basements and most other urban uses. Frost action is a severe limitation for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 4W.

Rw—Rowland silt loam

This is a nearly level, very deep, moderately well drained soil on flood plains. Slopes are smooth and range from 0 to 3 percent. Areas of this soil are long and narrow in shape and range from 5 to 200 acres in size.

Typically, the surface layer is dark reddish brown, very friable silt loam about 10 inches thick. The subsoil is about 18 inches thick. It is reddish brown, friable silt loam to a depth of 16 inches and reddish brown, mottled, friable silt loam to a depth of 28 inches. The substratum extends to a depth of 60 inches. It is weak red, mottled, firm silty clay loam to a depth of 44 inches and weak red, stratified sand and gravel to a depth of 60 inches. In some areas the stratified substratum is at a depth of less than 40 inches. In a few areas depth to bedrock is less than 60 inches. In some areas the surface layer is loam or sandy loam.

Included with this soil in mapping are a few, small, scattered areas of somewhat poorly drained Bowmansville soils on slightly lower rises and poorly drained Lamington soils in swales and narrow drainageways. Also included are a few, small areas of moderately well drained Raritan soils on ridgetops and side slopes of low stream terraces. Bowmansville and Lamington soils are grayish throughout. Raritan soils have a fragipan. Also included are some areas of soils that are subject to rare flooding during periods of heavy rainfall. Included soils make up about 15 percent of the map unit.

Permeability in this Rowland soil is moderate or moderately slow in the surface layer and subsoil and moderately rapid in the substratum. Available water capacity is moderate. Surface runoff is slow. This soil is subject to frequent flooding for brief periods, mainly in late winter and early spring. In unlimed areas it is very strongly acid to moderately acid throughout. The seasonal high water table is at a depth of 18 to 36 inches.

In most areas this soil is used for cropland or pasture. In some small areas it is used for woodland or is idle land.

This soil is well suited to corn and soybeans. It is fairly well suited to small grain, however, because floodwater causes severe crop damage. The main hazard is frequent flooding. Existing, well maintained dikes and levees help to overcome flooding in large areas. Crop residue management, cover crops, and green manure crops help to maintain organic matter content and to improve soil tilth.

This soil is well suited to pasture. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. Equipment limitation is the main management concern. Prolonged seasonal wetness hinders harvesting, logging, and seedling planting. Equipment should be used only during periods when the soil is relatively dry or frozen. Machine planting is practical in large areas.

This soil is unsuited to use as sites for onsite waste disposal and dwellings because flooding is a severe limitation. Wetness and frost action are severe limitations for local roads and streets.

The land capability classification is 2W. The woodland ordination symbol is 4W.

StC—Steinsburg channery sandy loam, 8 to 15 percent slopes

This is a strongly sloping, moderately deep, well

drained soil on ridgetops and side slopes. Slopes are convex. Areas of this soil are long and narrow in shape and range from 5 to 50 acres in size.

Typically, the surface layer is reddish brown, friable channery sandy loam about 10 inches thick. The subsoil is yellowish red, friable channery sandy loam about 10 inches thick. The substratum to a depth of 26 inches is reddish brown, friable channery loamy sand. Reddish brown, sandstone bedrock is at a depth of about 26 inches. In some areas the soil is gently sloping and moderately steep. In a few areas the soil is redder throughout or has more silt throughout. In some areas depth to bedrock is less than 20 inches.

Included with this soil in mapping are a few, scattered areas of deep, Lansdale soils and very deep Lewisberry soils on knobs and narrow ridgetops above the Steinsburg soil. Also included are small areas of somewhat excessively drained Klinesville soils on sides of hills. Klinesville soils have more coarse sand and rock fragments throughout than the Steinsburg soil. Included soils make up about 15 percent of the map unit.

Permeability in this Steinsburg soil is moderately rapid. Available water capacity is low or very low. Surface runoff is rapid. In unlimed areas this soil is extremely acid to strongly acid throughout. Depth to bedrock restricts root penetration.

In most areas this soil is used for cropland or pasture. In some areas it is used for woodland or idle land.

This soil is fairly well suited to corn, soybeans, and small grain. Erosion is the major hazard, and low or very low available water capacity is a limitation. During periods when rainfall is below normal or is poorly distributed, drought can damage crops. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The seedling mortality is the main management concern. Selecting proper planting stock and limited overstocking help to reduce seedling mortality. Seedlings survive and grow well if competing vegetation is controlled, especially during the first few years, and if livestock is excluded from the wooded areas. Machine planting is generally practical in large areas.

Depth to bedrock is a severe limitation for onsite waste disposal. Depth to bedrock and slope are moderate limitations for dwellings. Slope and large stones are moderate limitations for local roads and streets.

The land capability classification is 3E. The woodland ordination symbol is 8F.

StD—Steinsburg channery sandy loam, 15 to 25 percent slopes

This is a moderately steep, moderately deep, well drained soil on sides of ridges. Slopes are convex. Areas of this soil are long and narrow in shape and range from 5 to 50 acres in size.

Typically, the surface layer is reddish brown, friable channery sandy loam about 10 inches thick. The subsoil is yellowish red, friable channery sandy loam about 10 inches thick. The substratum to a depth of 26 inches is reddish brown, friable channery loamy sand. Reddish brown sandstone bedrock is at a depth of about 26 inches. In some areas the soil is strongly sloping, steep, and very steep. In a few areas the soil is redder throughout or has more silt throughout. In some areas depth to bedrock is less than 20 inches.

Included with this soil in mapping are a few, scattered areas of deep, Lansdale soils and very deep Lewisberry soils on knobs and narrow ridgetops above the Steinsburg soil. Also included are small areas of somewhat excessively drained Klinesville soils on sides of hills. Klinesville soils have more coarse sand and rock fragments throughout than the Steinsburg soil. Included soils make up about 15 percent of the map unit.

Permeability in this Steinsburg soil is moderately rapid. Available water capacity is low or very low. Surface runoff is rapid. In unlimed areas this soil is extremely acid to strongly acid throughout. Depth to bedrock restricts root penetration.

In most areas this soil is used for cropland or pasture. In some areas it is used for woodland or idle land.

This soil is poorly suited to corn, soybeans, and small grain. Erosion is the major hazard and low or very low available water capacity is a limitation. During periods when rainfall is below normal or poorly distributed, drought can damage crops. Conservation management practices are needed to reduce runoff and to control erosion if cultivated crops are grown. They include a cropping sequence that includes grasses and legumes, a conservation tillage system that leaves protective amounts of crop residue on the surface, contour farming, and grassed waterways. Cover crops and crop residue management help to control erosion, to maintain organic matter content, and to improve soil tilth.

This soil is well suited to pasture. Growing grasses and legumes is effective in controlling erosion. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderately high. The equipment limitation and seedling mortality are major management concerns. When the soil is wet, logging roads become slippery and quickly rutted. Use of planting or logging equipment is limited during wet periods. Selecting proper planting stock and limited overstocking help to reduce seedling mortality. Seedlings survive and grow well if competing vegetation is controlled, especially during the first few years and if livestock is excluded from wooded areas. Machine planting is generally practical in large areas.

Depth to bedrock and slope are severe limitations for onsite waste disposal. Slope is a severe limitation for dwellings and local roads and streets.

The land capability classification is 4E. The woodland ordination symbol is 8F.

Uc—Urban land

This map unit consists of nearly level to strongly sloping areas on broad uplands, in depressions, and along drainageways. Slopes are smooth, concave, or convex. Areas are rectangular or irregular in shape and range from 10 to more than 1,000 acres in size.

Urban land consists of areas where 75 percent or more of the land surface is covered with roads, streets, parking lots, houses, shopping centers, factories, and other structures. On Urban land, the soils are so obscured or altered that they could not be identified.

Included with this unit in mapping are small areas of soils on slopes of more than 15 percent and open areas. The open areas consist of miscellaneous fill materials, soils that have been excavated or smoothed, and, to a lesser extent, relatively undisturbed soils. Included areas make up about 15 percent of the map unit.

In most areas Urban land is in residential, commercial, and industrial use. In a few areas it is used for schools, hospitals, cemeteries, or recreation areas.

Onsite investigation is needed if areas of Urban land are used as building sites.

The land capability classification is 8S. A woodland ordination symbol has not been assigned.

UdB—Urban land-Chester complex, 0 to 8 percent slopes

This map unit consists of nearly level and gently sloping areas of Urban land and the Chester soil on ridgetops and in depressions on uplands. The Chester soil is very deep and well drained. It is closely intermingled with areas of Urban land. Slopes are smooth, concave, and convex. Areas of this unit are rectangular or long and narrow in shape and range from 10 to 200 acres in size. They are 65 percent Urban land, 20 percent Chester soil, and 15 percent included soils.

Urban land consists of areas where 75 percent or more of the surface is covered with roads, streets, parking lots, houses, shopping centers, factories, and other structures. On Urban land, the soils are so obscured or altered that they could not be identified.

Typically, the surface layer of the Chester soil is dark brown, friable silt loam about 11 inches thick. The subsoil is about 29 inches thick. It is strong brown, friable silt loam to a depth of 17 inches; strong brown, friable silty clay loam and silt loam to a depth of 36 inches; and reddish brown, friable loam to a depth of 40 inches. The substratum to a depth of 60 inches is strong brown, friable and very friable, very micaceous channery sandy loam. In some areas the soil is strongly sloping and moderately steep.

Included with this soil in mapping are a few, scattered areas of very deep, moderately well drained Glenville soils in slight depressions and along narrow drainageways on lowlands. Also included are some small areas of very deep, somewhat excessively drained Manor soils and moderately deep Mt. Airy soils on narrow, low breaks adjacent to major streams. Glenville soils have gray mottles in the lower part of the subsoil. Manor and Mt. Airy soils have more rock fragments and less clay throughout. Also included are

some areas of Glenelg soils on narrow ridgetops and sides of broad ridges. Included soils make up about 15 percent of the map unit.

Permeability of the Chester soil is moderate. Available water capacity is moderate or high. Surface runoff is rapid. In unlimed areas this soil is very strongly acid or strongly acid.

In most areas this map unit is used for residences, schools, commerce, and industry. The Chester soil is in yards, vacant lots, lawns, gardens, cemeteries, athletic fields, and other open areas.

The Chester soil is well suited to vegetables, flowers, grasses, trees, and shrubs. It has few limitations for gardens, lawns, landscaping, golf courses, and recreation areas.

On the Chester soil moderate permeability is a moderate limitation for onsite waste disposal. The soil is suitable as sites for dwellings and most other urban uses. In most areas of the map unit the surface is drained by sewers and gutters. Frost action is a moderate limitation for local roads and streets. Onsite investigation is needed to determine areas of the Chester soil.

The land capability classification is 8S for Urban land and 2E for the Chester soil. A woodland ordination symbol has not been assigned for Urban land. It is 4A for the Chester soil.

UeB—Urban land-Conestoga complex, 0 to 8 percent slopes

This map unit consists of nearly level and gently sloping Urban land and the Conestoga soil on ridgetops and in depressions on uplands. The Conestoga soil is very deep and well drained. It is closely intermingled with areas of Urban land. Slopes are smooth, concave, and convex. Areas of this unit are rectangular or long and narrow in shape and range from 10 to 200 acres in size. The unit is 65 percent Urban land, 20 percent Conestoga soil, and 15 percent included soils.

Urban land consists of areas where 75 percent or more of the surface is covered by roads, streets, parking lots, houses, shopping centers, factories, and other structures. On Urban land the soils are so obscured or altered that they could not be identified.

Typically, the surface layer of the Conestoga soil is dark brown, friable silt loam about 9 inches thick. The subsoil is about 31 inches thick. It is brown, friable silt loam to a depth of 17 inches; yellowish brown, friable silty clay loam to a depth of 24 inches; and brown, friable silty clay loam to a depth of 40 inches. The substratum to a depth of 60 inches is variegated brown, yellowish brown, and strong brown, friable silt loam and loam. In some areas the soil is strongly sloping and moderately steep.

Included with this soil in mapping are a few, scattered areas of very deep, moderately well drained Clarksburg soils at the base of side slopes below the Conestoga soil. Also included are some small areas of well drained Hagerstown soils on low rises and broad flats below the Conestoga soil and a few, small areas of very deep, somewhat poorly drained Penlaw soils in swales on lowlands. Clarksburg soils have gray mottles in the middle and lower parts of the subsoil and have a fragipan. Hagerstown soils have more clay throughout than the Conestoga soil. Penlaw soils have gray mottles throughout. Included soils make up about 15 percent of the map unit.

Permeability of the Conestoga soil is moderate. Available water capacity is moderate or high. Surface runoff is slow or medium. In unlimed areas this soil is very strongly acid to neutral in the solum and moderately acid to slightly alkaline in the substratum.

In most areas this map unit is used for residences, schools, commerce, and industry. The Conestoga soil is in yards, vacant lots, lawns, gardens, cemeteries, athletic fields, and other open areas.

The Conestoga soil is well suited to vegetables, flowers, grasses, trees, and shrubs. It has few limitations for gardens, lawns, landscaping, golf courses, and recreation areas.

On the Conestoga soil moderate permeability is a moderate limitation for onsite waste disposal. The soil is suitable as sites for dwellings and most other urban uses. In most areas of the map unit the surface is drained by sewers and gutters. Low strength and frost action are moderate limitations for local roads and streets. Onsite investigation is needed to determine areas of the Conestoga soil.

The land capability classification is 8S for Urban land and 2E for the Conestoga soil. The woodland ordination symbol has not been assigned for Urban land. It is 5A for the Conestoga soil.

UfC—Urban land-Mt. Airy complex, 8 to 15 percent slopes

This map unit consists of strongly sloping Urban land and the Mt. Airy soil on ridgetops and side slopes on uplands. The Mt. Airy soil is moderately deep and somewhat excessively drained. It is closely intermingled with areas of Urban land. Slopes are smooth, concave, and convex. Areas of this unit are rectangular or long and narrow in shape and range from 10 to 200 acres in size. The unit is 60 percent Urban

land, 25 percent Mt. Airy soil, and 15 percent included soils.

Urban land consists of areas where 75 percent or more of the surface is covered by roads, streets, parking lots, houses, shopping centers, factories, and other structures. On Urban land the soils are so obscured or altered that they could not be identified.

Typically, the surface layer of the Mt. Airy soil is dark brown, friable channery silt loam about 8 inches thick. The subsoil is about 12 inches thick. It is yellowish brown, friable channery silt loam to a depth of 15 inches and strong brown, friable very channery silt loam to a depth of 20 inches. The substratum to a depth of 32 inches is brown and dark yellowish brown, very friable extremely channery, micaceous loam. In some areas the soil is moderately steep and steep.

Included with this soil in mapping are a few, scattered areas of Chester soils on broad ridgetops and a few areas of Edgemont soils at the heads of drains. Also included are small areas of Glenelg soils on narrow ridgetops and sides of lower ridges. These soils are well drained. They are have more clay throughout than the Mt. Airy soil. Also included are some small areas of very deep, Manor soils in landscape positions similar to those of the Mt. Airy soil. Included soils make up about 15 percent of the map unit.

Permeability of the Mt. Airy soil is moderate in the surface layer and moderate or moderately rapid in the subsoil and in the substratum. Available water capacity is low and surface runoff is rapid. In unlimed areas this soil is very strongly acid or strongly acid throughout. Depth to bedrock restricts root penetration.

In most areas this map unit is used for residences, schools, commerce, and industry. The Mt. Airy soil is in the open areas. It is in yards, vacant lots, lawns, gardens, cemeteries, and athletic fields.

The Mt. Airy soil is poorly suited to vegetables and flowers and fairly well suited to grasses, trees, and shrubs. Slope, severe erosion hazard, low available water capacity for plants, and rock fragments in the surface layer are limitations for gardens, lawns, landscaping, golf courses, and recreation areas.

On the Mt. Airy soil moderate or moderately rapid permeability and slope is a moderate limitation for onsite waste disposal. Slope is a moderate limitation for dwellings and most other urban uses. In most areas of the map unit the surface is drained by sewers and gutters. Slope and frost action are moderate limitations for local roads and streets.

Onsite investigation is needed to determine areas of the Mt. Airy soil.

The land capability classification is 8S for Urban land and 4E for the Mt. Airy soil. A woodland ordination symbol has not been assigned for Urban land. It is 3F for the Mt. Airy soil.

UgB—Urban land-Penn complex, 0 to 8 percent slopes

This map unit consists of nearly level and gently sloping Urban land and Penn soil in depressions on broad uplands (fig. 18). The Penn soil is moderately deep and well drained. It is closely intermingled with areas of Urban land. Slopes are smooth, concave, and convex. Areas of this unit are rectangular or long and narrow in shape and range from 10 to 100 acres in size. They are 60 percent Urban land, 25 percent Penn soil, and 15 percent included soils.

Urban land consists of areas where 75 percent or more of the surface is covered by roads, streets, parking lots, houses, shopping centers, factories, and other structures. On Urban land the soils are so obscured or altered that they could not be identified.

Typically, the surface layer of the Penn soil is dark reddish brown, friable silt loam about 9 inches thick. The subsoil is about 21 inches thick. It is reddish brown, friable silt loam to a depth of 14 inches; dusky red, firm silt loam to a depth of 24 inches; and dusky red, firm channery silt loam to a depth of 30 inches. The substratum to a depth of 38 inches is dusky red, very firm very channery silt loam. Fractured, dusky red siltstone bedrock is at a depth of about 38 inches. In some areas the soil is strongly sloping.

Included with this soil in mapping are a few, scattered areas of shallow, somewhat excessively drained Klinesville soils on the middle part of shoulder slopes. Also included are some small areas of deep, well drained Lansdale soils on the upper part of shoulder slopes and a few, small areas of deep, moderately well drained Readington soils and moderately deep Reaville soils on low rises, along drainageways, and in depressions on lowlands. Klinesville and Lansdale soils have more sand and rock fragments and less clay throughout than the Penn soil. Readington and Reaville soils have gray mottles in the lower part of the subsoil. Included soils make up about 15 percent of the map unit.

Permeability of the Penn soil is moderate or moderately rapid. Available water capacity is low or moderate. Surface runoff is slow or medium. In unlimed areas this soil is extremely acid to strongly acid in the upper part of the solum, strongly acid or moderately acid in the lower part, and strongly acid to slightly acid in the substratum. Depth to bedrock restricts root penetration.

Figure 18.—A new residential development in an area of Urban land-Penn complex, 0 to 8 percent slopes.

In most areas this map unit is used for residences, schools, commerce, and industry. The Penn soil is in open areas. It is in yards, vacant lots, lawns, gardens, cemeteries, and athletic fields.

The Penn soil is fairly well suited to vegetables, flowers, grasses, trees, and shrubs. The severe hazard of erosion, low available water capacity for plants, and rock fragments in the surface layer are limitations for gardens, lawns, landscaping, golf courses, and recreation areas.

On the Penn soil moderate or moderately rapid permeability and depth to bedrock are severe limitations for onsite waste disposal. The Penn soil is suitable as sites for dwellings without basements. Depth to bedrock is a moderate limitation for dwellings with basements and most other urban uses. In most areas of the map unit the surface is drained by sewers and gutters. Frost action is a moderate limitation for local roads and streets. Onsite investigation is needed to determine areas of the Penn soil.

The land capability classification is 8S for Urban land and 2E for the Penn soil. A woodland ordination symbol has not been assigned for Urban land. It is 3A for the Penn soil.

WaA—Watchung silt loam, 0 to 3 percent slopes

This map unit consists of a nearly level, very deep, poorly drained soil in depressions and along drainageways on lowlands. Slopes are smooth or concave. Areas of this soil are oval, irregular, or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is very dark gray, friable silt loam about 2 inches thick. The subsurface layer is dark grayish brown, mottled, friable silt loam about 7 inches thick. The subsoil is about 31 inches thick. It is dark gray, mottled, firm silty clay to a depth of 18 inches; gray, mottled, firm clay to a depth of 25 inches; gray, mottled friable silty clay loam to a depth of 30 inches; and olive, mottled, friable clay loam to a depth of 40 inches. The substratum to a depth of 60 inches is yellowish brown, mottled, firm loam. In some areas the soil is gently sloping. In some areas the subsoil has more sand and less clay or depth to bedrock is less than 60 inches. In a few areas the surface layer is black.

Included with this soil in mapping are a few, small

areas of deep, somewhat poorly drained Lehigh and Mount Lucas soils on slightly higher lying, broader ridgetops above the Watchung soil. Also included are some areas on the lowest part of lowlands that are subject to occasional flooding. Also included are some areas where a few, large boulders are on or below the surface. Included soils make up about 15 percent of the map unit.

Permeability of this Watchung soil is moderate or moderately slow in the surface layer, slow or very slow in the subsoil, and moderate or moderately slow in the substratum. Available water capacity is high, and surface runoff is slow to ponded. The seasonal high water table is at a depth of 0 to 12 inches, mainly in winter and early spring. In unlimed areas this soil is very strongly acid to slightly acid in the surface layer, strongly acid to neutral in the subsoil, and moderately acid to neutral in the substratum.

In most areas this soil is used for pasture or woodland or is idle land. In some drained areas it is used for cropland.

This soil is poorly suited to cultivated crops and such deep-rooted legumes as alfalfa because of wetness and very slow and slow permeability in the subsoil. Existing, well maintained, shallow surface drains or tile drains help to remove excessive water. Cover crops and a conservation tillage system that leaves protective amounts of crop residue on the surface help to maintain organic matter content and to improve soil tilth.

This soil is well suited to pasture. It is poorly suited to such deep-rooted legumes as alfalfa because the very slow and slow permeability in the subsoil restricts root penetration and downward movement of water. Overgrazing or grazing when the soil is wet, however, damages the sod, reduces plant density and forage yields, and causes surface compaction, poor tilth, and increased surface runoff. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, application of fertilizers, and restricted use during wet periods.

Potential productivity for trees on this soil is moderate. The main management concerns are the equipment limitation and seedling mortality. The rooting depth is restricted by the seasonal high water table. Equipment should be operated only when the soil is relatively dry or frozen. Using special planting stock and overstocking help to reduce seedling mortality. Machine planting is practical in large areas.

Wetness and very slow and slow permeability in the subsoil are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses. Wetness, low strength, and frost action are severe limitations for local roads and streets.

The land capability classification is 4W. The woodland ordination symbol is 4W.

WaB—Watchung silt loam, 3 to 8 percent slopes

This is a gently sloping, very deep, poorly drained soil in depressions and along drainageways on lowlands. Slopes are smooth or concave. Areas of this soil are oval, irregular, or long and narrow in shape and range from 5 to 100 acres in size.

Typically, the surface layer is very dark gray, friable silt loam about 2 inches thick. The subsurface layer is dark grayish brown, mottled, friable silt loam about 7 inches thick. The subsoil is about 31 inches thick. It is dark gray, mottled, firm silty clay to a depth of 18 inches; gray, mottled, firm clay to a depth of 25 inches; gray, mottled friable silty clay loam to a depth of 30 inches; and olive, mottled, friable clay loam to a depth of 40 inches. The substratum to a depth of 60 inches is yellowish brown, mottled, firm loam. In some areas the soil is nearly level or strongly sloping. In some areas the subsoil has more sand and less clay or depth to bedrock is less than 60 inches. In a few areas the surface layer is black.

Included with this soil in mapping are a few, small areas of deep, somewhat poorly drained Lehigh and Mount Lucas soils on slightly higher lying, broader ridgetops above the Watchung soil. Also included, on the lowest part of lowlands, are some areas of soils that are subject to occasional flooding. Also included are some areas where a few, large boulders are on or below the surface. Included areas make up about 15 percent of the map unit.

Permeability in this Watchung soil is moderate or moderately slow in the surface layer, slow or very slow in the subsoil, and moderate or moderately slow in the substratum. Available water capacity is high, and surface runoff is medium. The seasonal high water table is at a depth of 0 to 12 inches, mainly in winter and early spring. In unlimed areas this soil is very strongly acid to slightly acid in the surface layer, strongly acid to neutral in the subsoil, and moderately acid to neutral in the substratum.

This soil is used for pasture or woodland or is idle land. It is unsuited to cultivated crops because of wetness and very slow and slow permeability in the subsoil.

This soil is fairly well suited to pasture. It is unsuited to such deep-rooted legumes as alfalfa because the

very slow and slow permeability in the subsoil restricts root penetration and downward movement of water. Overgrazing or grazing when the soil is wet, however, causes surface compaction and poor tilth. Management practices are needed to help keep the pasture and the soil in good condition. They include proper stocking rates to maintain key plant species, pasture rotation, timely deferred grazing, applications of lime and fertilizer, and restricted use during wet periods.

Potential productivity for trees on this soil is moderate. The main management concerns are the equipment limitation and seedling mortality. The rooting depth is restricted by the seasonal high water. Equipment should be operated only when the soil is relatively dry or frozen. Using special planting stock and overstocking help to reduce seedling mortality. Machine planting is practical in large areas.

Wetness and very slow and slow permeability in the subsoil are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses. Wetness, low strength, and frost action are severe limitations for local roads and streets.

The land capability classification is 6W. The woodland ordination symbol is 4W.

WbB—Watchung silt loam, 0 to 8 percent slopes, extremely bouldery

This is a nearly level and gently sloping, very deep, poorly drained soil in depressions and along drainageways on lowlands. Slopes are smooth or concave. Areas of this soil are oval, irregular, or long and narrow in shape and range from 5 to 400 acres in size. Stones and boulders ranging from 10 inches to more than 6 feet in diameter cover about 3 to 15 percent of the surface.

Typically, the surface layer is very dark gray, friable silt loam about 2 inches thick. The subsurface layer is dark grayish brown, mottled, friable silt loam about 7 inches thick. The subsoil is about 31 inches thick. It is dark gray, mottled, firm silty clay to a depth of 18 inches; gray, mottled, firm clay to a depth of 25 inches; gray, mottled, friable silty clay loam to a depth of 30 inches; and olive, mottled, friable clay loam to a depth of 40 inches. The substratum to a depth of 60 inches is yellowish brown, mottled, firm loam. In some areas the soil is nearly level or strongly sloping. In some areas the subsoil has more sand and less clay or depth to bedrock is less than 60 inches. In a few areas the surface layer color is black.

Included with this soil in mapping are a few, small areas of deep, somewhat poorly drained Lehigh and Mount Lucas soils on slightly higher lying, broader ridgetops above the Watchung soil. Also included are some small areas of well drained Highfield and Neshaminy soils on hills and ridges above the Watchung soil. Included soils make up about 15 percent of the map unit.

Permeability in this Watchung soil is moderate or moderately slow in the surface layer, slow or very slow in the subsoil, and moderate or moderately slow in the substratum. Available water capacity is high, and surface runoff is slow or medium. The seasonal high water table is at a depth of 0 to 12 inches, mainly in winter and early spring. In unlimed areas this soil is very strongly acid to slightly acid in the surface layer, strongly acid to neutral in the subsoil, and moderately acid to neutral in the substratum.

This soil is used for pasture or woodland or is idle land. It is unsuited to cultivated crops and grasses and legumes for permanent pasture. Use of most types of farm machinery is impractical because of wetness and stones and boulders on the surface.

Potential productivity for trees on this soil is moderate. The main management concerns are the equipment limitation and seedling mortality. The rooting depth is restricted by the seasonal high water table. Equipment should be operated only when the soil is relatively dry or frozen. Using special planting stock and overstocking help to reduce seedling mortality. Machine planting is practical in large areas.

Wetness and very slow and slow permeability in the subsoil are severe limitations for onsite waste disposal. Wetness is a severe limitation for dwellings and most other urban uses. Wetness, low strength, and frost action are severe limitations sites for local roads and streets.

The land capability classification is 7S. The woodland ordination symbol is 4X.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. Identification of prime farmland is a major step in meeting the Nation's needs for food and fiber.

The U. S. Department of Agriculture defines prime farmland as land best suited to food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to produce a sustained high yield of crops while using acceptable farming methods. Prime farmland produces the highest yields and requires minimal amounts of energy and economic resources, and farming it results in the least damage to the environment.

An area identified as prime farmland must be used for producing food or fiber crops or must be available for those uses. Thus, urban and built-up land and water areas are not classified as prime farmland.

The general criteria for prime farmland are as follows: a generally adequate and dependable supply of moisture from precipitation or irrigation, favorable temperature and growing-season length, acceptable levels of acidity or alkalinity, few or no rocks, and permeability to air and water. Prime farmland is not excessively erodible, is not saturated with water for long periods, and is not flooded during the growing season. The slope ranges mainly from 0 to 8 percent. For more detailed information on the criteria for prime farmland, consult the local office of the Natural Resources Conservation Service.

Prime farmland takes in about 208,000 acres, or about 36 percent of the total acreage of York County. About 60 percent of the prime farmland lies in the Piedmont Uplands section in the southern part of the county; about 11 percent is in the Conestoga Valley; and about 28 percent is in the Triassic Lowland section in the northern part.

The map units or soils that make up prime farmland in York County are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each unit is shown in table 4. The location of each map unit is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units."

Hydric Soils

In this section hydric soils are defined and described.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (COWARDIN 1979, ENVIRON 1987, NRC 1995, TINER 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (FREG 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria which identify those estimated soil properties unique to hydric soils have been established (FREG 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties described in "Soil Taxonomy" (USDA 1999) and in the "Soil Survey Manual" (USDA 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be observed in the field. These visible properties are indicators of hydric soils. The indicators that can be used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (USDA 1996).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described as deep as necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if one (or more) of the approved indicators is present.

This survey can be used to locate probable areas of hydric soils.

The map units that meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators are listed in table 6. The local landform is given for both hydric components and hydric inclusions. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (NRC 1995, USDA 1996).

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions of the landform. Map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions of the landform.

Table 7 lists the map units with hydric inclusions. These map units, in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, has the potential to include hydric soils. Onsite investigation is recommended to determine the presence and location of the included hydric soils. The local landforms of the hydric soil inclusions are given in table 7.

In tables 6 and 7, in the column "Natural condition of the soil," *Wooded* indicates the soil supports woody vegetation under natural conditions.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the county. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils are identified; they include some not commonly grown in the survey area. The system of land capability classification used by the Natural Resources Conservation Service is explained. The estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under “Detailed Soil Map Units.” Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Farming is the major land use in York County. The 1982 Census of Agriculture (USDC 1983) indicated that about 250,000 acres was used for crops, pasture, or hay. Of this acreage, about 13,000 acres was used for permanent pasture. The Pennsylvania statistical summary for 1987-88 reported 87,300 acres of corn (PENN 1988). It also reported 48,000 acres of alfalfa and other hay crops, 41,500 acres of small grain, 20,200 acres of soybeans, and 5,134 acres of vegetable crops. The report also showed 3,627 acres of orchards, 2,090 acres of potatoes, and the rest idle cropland.

In 1987, York County was first in Pennsylvania in the production of wheat, barley, and soybeans (PENN 1988). It was second in number of farms, hogs, and pigs. It was third in production of peaches and corn for grain and seventh in total agricultural sales.

Water erosion is a major management concern on most sloping cropland and overgrazed pasture in York County. Erosion is a hazard on all soils on slopes of more than 1 percent.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils that are shallow and moderately deep to bedrock; on soils that have low available water capacity, such as Klinesville, Penn, Steinsburg, and Mt. Airy soils; and on soils where the root zone is restricted by a layer in or below the subsoil. On Clarksburg soils, for example, plant roots cannot penetrate the fragipan; hence, the root zone consists of soil material above the fragipan. As erosion removes the topsoil, it reduces the depth of the root zone. Second, soil erosion on farmland results in

sedimentation of streams. Control of erosion minimizes the pollution of streams by sediment and improves water quality for municipal use, for recreation, and for fish and wildlife.

Measures that control erosion provide a protective cover, reduce the runoff rate, and increase the infiltration rate. A cropping system that keeps vegetative cover on the surface for extended periods can minimize soil losses and help to maintain the productive capacity of the soils. On livestock farms, where forage crops are grown, including legumes and grasses in the cropping sequence helps to control erosion on sloping land, to provide additional nitrogen, and to improve soil tilth for the following crop.

Terraces and diversions shorten the length of slopes and thus help to reduce surface runoff and to control erosion. They are most practical on deep, well drained soils that are highly susceptible to erosion. Terraces reduce soil loss and associated fertilizer loss; help to prevent the damage to crops and water courses caused by eroding sediments; and help to eliminate the need for grassed waterways, which take productive land out of row crop production. They also make farming on the contour easier and thus reduce fuel consumption and the amount of pesticides entering watercourses.

Alternatives to terracing can be used where terracing is unsuitable or not preferred. Contour stripcropping, for example, helps to control erosion by alternating contoured strips of close-growing crops with clean-tilled crops. Strips of grasses or grasses and legumes are generally used for hay. Areas between strips are cultivated and planted to row crops grown on the contour. Conservation tillage is effective in controlling erosion on sloping soils. It is becoming more common in York County. It can be used on many soils. On soils subject to erosion, special management techniques are needed when a system of conservation tillage is applied.

Soil drainage is a major management concern on some soils in the county. On Baile, Croton, Penlaw, and Watchung soils, during part of the year natural wetness reduces crop production. It is common for existing, well maintained drainage systems to increase crop yields by 50 percent.

Some small, wet areas are in drainageways and depressions. They are generally within larger areas of well drained and moderately well drained soils. Applying artificial drainage to these areas generally is not practical.

On most soils used for crops in York County, organic matter content is low. Generally, the structure of these soils is weak, and after intensive rainfall generally the surface crusts when it dries. The crust is hard when dry, reduces the infiltration of water, and increases runoff. Regular additions of crop residue, manure, and other organic material improve soil structure and help to prevent surface crusting.

Generally, fall plowing is not advisable on soils that have a surface layer that is silt loam and low in organic matter. It results in the formation of a crust in winter and spring. After fall plowing, many soils are nearly as dense and hard at planting time as they were before plowing. On sloping soils fall plowing causes accelerated erosion.

Special crops produced in the county include apples, peaches, grapes, other fruit, vegetables, and nursery plants. They grow well on deep and very deep soils that have good natural drainage and that warm up early in spring. Good air drainage is needed to reduce frost damage to apples, peaches, and other tree fruits. Undulating to rolling Arendtsville, Chester, Edgemont, Glenelg, Highfield, Legore, Lewisberry, Lansdale, and Neshaminy soils generally have the best soil properties for fruit crops.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 8. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trails and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 8 are grown in

the survey area. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops (USDA 1961). Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Arabic numerals 1 through 8. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations or hazards that restrict their use.

Class 2 soils have severe limitations or hazards that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations or hazards that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations or hazards that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class 6 soils have severe limitations or hazards that make them generally unsuitable for cultivation.

Class 7 soils have severe limitations or hazards that make them unsuitable for cultivation.

Class 8 soils and miscellaneous areas have limitations or hazards that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a capital letter, *E, W, S,* or *C,* to the class numeral, for example, 2E. The letter *E* shows that the main hazard is risk of erosion unless close-growing plant cover is maintained; *W* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *S* shows that the soil is limited mainly because it is shallow, droughty, or stony.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *W* or *S* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in table 8, "Land Capability and Yields Per Acre of Crops and Pasture."

Woodland Management and Productivity

Table 9 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity (SAF 1954).

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic feet per acre per year, which the indicator species can produce. The number 1 indicates low potential productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; *F*, a high content of rock fragments in the soil, and *L*, low strength. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, and L.

In table 9, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, fire lanes, and log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope and on the erosion factors K and Kf shown in table 17. A rating of *slight* indicates that no particular

prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities. The proper construction and maintenance of roads, trails, landings, and the fire lanes will help overcome the erosion hazard.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that equipment use normally is not restricted either in kind of equipment that can be used or time of year because of soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 2 months. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 2 to 6 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 6 months.

Choosing the most suitable equipment and timing harvesting and other management operations to avoid seasonal limitations help to overcome the equipment limitation.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

The use of special planting stock and special site preparation, such as bedding, furrowing, or surface drainage, can help reduce seedling mortality.

Windthrow hazard is the likelihood that trees will be uprooted (tipped over) by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods of soil wetness. The use of specialized equipment that does not damage surficial root systems during partial cutting operations can help reduce windthrow. Care in thinning or no thinning also can help reduce windthrow.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied. Adequate site preparation before planting the crop can help to reduce plant competition.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Common trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume of wood fiber*, a number, represents an expected volume produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced on a fully stocked, even-aged, unmanaged stand.

The first tree species listed under common trees for a soil is the indicator species for that soil. The indicator species is the species that is common in the area. It is

generally the most productive on the soil. The productivity class of the indicator species is the number used for the ordination symbol.

Trees to plant are those that are suitable for commercial wood production.

Recreation

The soils of the survey area are rated in table 10 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 10, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 10 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 13 and interpretations for dwellings without basements and for local roads and streets in table 12.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils are gently sloping and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic (fig. 19). Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping the site or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 11, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soils is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management,

and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

Elements of wildlife habitat

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and the flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, soybeans, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, timothy, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are goldenrod, beggar-ticks, quackgrass, and ragweed.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, birch, cherry, maple, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for

Figure 19.—A picnic area on Neshaminy channery silt loam, 3 to 8 percent slopes.

planting on soils rated *good* are gray dogwood, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, yew, cedar, and hemlock.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, arrowhead, bur-reed, pickerelweed, cattail, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, swamps, and ponds.

Habitat for various kinds of wildlife

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, meadow vole, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, frogs, and tree swallow.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the “Soil Properties” section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in

this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 12 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 13 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if the soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 13 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is

evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. The absorption field must overlie unsaturated soil material to be an effective filter of effluent. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 13 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, stones, depth to bedrock, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes unsatisfactory functioning of a lagoon. Pollution results if seepage is excessive or if floodwater overtops the lagoon. Slope and bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 13 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock or over the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 14 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and

spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 14, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is effected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 15 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the

limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and high content of stones or boulders or organic matter. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 16 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under “Soil Series and Their Morphology.”

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. “Loam,” for example is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, “gravelly.” Textural terms are defined in the glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM 1993) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO 1986).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6.

Rock fragments larger than 10 inches in diameter or those 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, number 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on

laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical Properties of the Soils

Table 17 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Texture, kind of clay, content of organic matter, and soil structure influence moist bulk density.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, a change of 3 to 6 percent; and *high*, a change of 6 to 9 percent. *Very high*, a change of more than 9 percent, is sometimes used.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 17, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water

capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kf is the erodibility of the "rock free," fine earth material. It indicates the erodibility of the fine earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of wind or water erosion that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

The *wind erodibility index* is used in the wind erosion equation (WEQ). The index number indicates the amount of soil lost in tons per acre per year. The range of wind erodibility index numbers is 0 to 300.

Chemical Properties of the Soils

Table 18 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Cation-exchange capacity and *effective cation-exchange capacity* are measures of the soils's ability to retain cations. Such cations as calcium and potassium are plant nutrients. Soils that have a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizers and amendments than soils having a higher cation-exchange capacity.

Cation-exchange capacity is the amount of cations the soil can adsorb at pH 7.0. This measurement is reported for soils having a pH greater than 5.5. Effective cation-exchange capacity is the sum of the extractable bases plus aluminum reported for soils having a pH of less than 5.5. This measurement accounts for variable charge components in highly weathered soils.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Water Features

Table 19 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

Some soils in table 19 are assigned to two hydrologic soil groups. Dual grouping is used for one of two reasons: (1) Some soils have a seasonal high water but can be drained. In this instance the first letter applies to the drained condition of the soil and the second letter to the undrained condition. (2) In some soils that are less than 20 inches deep to bedrock, the first letter applies to areas where the bedrock is cracked and pervious and the second letter to areas where the bedrock is impervious or where exposed

bedrock makes up more than 25 percent of the surface of the soil.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in table 19, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 19 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs, on the average, once or less in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 19 are the depth to the seasonal high water table; the kind of water table—that is, perched, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 19.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Soil Features

Table 20 lists soil features that can influence what the soil is suited to or how it will behave under certain uses. These features are given for the whole soil or for certain layers. These features are based on field observations and on test data for these and similar soils.

Depth and hardness of bedrock are given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either “Soft” or “Hard.” If the rock is “Soft” or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is “Hard” or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of

segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based on the texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For *uncoated steel,* the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For *concrete,* the risk of corrosion is also expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 21 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Fluvaquents (*Fluv*, meaning flood plains, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The Typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Fluvaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, nonacid, mesic Typic Fluvaquents.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” (USDA 1993). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (USDA 1999) and in “Keys to Soil Taxonomy” (USDA 1998). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section “Detailed Soil Map Units.”

Arendtsville Series

The Arendtsville series is fine-loamy, mixed, mesic Typic Hapludults. It consists of very deep, well drained soils on ridges and hills. These soils formed in loamy

material weathered from breccia and conglomerate consisting of quartzite, metabasalt, and metarhyolite residuum. Slopes range from 3 to 25 percent.

Arendtsville soils are on the landscape with moderately deep, somewhat excessively drained Catoctin soils; well drained, deep Highfield soils; moderately well drained, deep Readington soils; and poorly drained, deep Croton soils. Catoctin soils are loamy-skeletal. Highfield soils are coarse-loamy. Unlike Arendtsville soils, Readington soils have a fragipan. Croton soils are fine-silty.

Typical pedon of Arendtsville gravelly loam, 3 to 8 percent slopes, 1.5 miles west of Biglerville in Butler Township, Adams County; 360 feet north of Township Route 369, about 50 feet west of intersection with Pennsylvania Route 234; in an apple orchard:

Ap—0 to 9 inches; dark reddish brown (5YR 3/3) gravelly loam, light reddish brown (5YR 6/3) dry; weak fine granular structure; friable, nonsticky, slightly plastic; many roots; 15 percent rock fragments; slightly acid; clear smooth boundary.

Bt1—9 to 16 inches; reddish brown (5YR 4/3) gravelly loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common roots; few faint clay films on faces of peds; 15 percent rock fragments; slightly acid; gradual wavy boundary.

Bt2—16 to 28 inches; dark reddish brown (2.5YR 3/4) gravelly sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky, plastic; common roots; common faint clay films on faces of peds and in pores; few prominent organic coatings on faces of peds; 15 percent rock fragments; moderately acid; gradual wavy boundary.

Bt3—28 to 40 inches; dark red (2.5YR 3/6) gravelly sandy clay loam; moderate medium and coarse subangular blocky structure; friable, slightly sticky, plastic; few roots; common faint clay films on faces of peds and in pores; few prominent organic coatings on faces of peds; 15 percent rock fragments; strongly acid; gradual wavy boundary.

Bt4—40 to 53 inches; dark red (2.5YR 3/6) gravelly sandy loam; weak fine subangular blocky structure; friable, nonsticky, nonplastic; few roots; few faint clay films and common prominent black coatings on faces of peds and rock fragments; 30 percent rock fragments; very strongly acid; gradual irregular boundary.

C—53 to 72 inches; reddish brown (2.5YR 4/4) and weak red (2.5YR 4/2) very gravelly sandy loam; massive; friable, nonsticky, nonplastic; few faint clay films bridging some sand grains and rock fragments; 40 percent rock fragments; very strongly acid.

The solum is 40 to 60 inches thick. Breccia bedrock is at a depth of more than 72 inches. Rock fragments range from 5 to 35 percent in the solum and 20 to 80 percent in the substratum. In unlimed areas reaction ranges from extremely acid to moderately acid in the upper part of the subsoil and from extremely acid to strongly acid in the lower part and in the substratum.

The Ap horizon has hue of 5YR to 10YR, value and chroma of 3 or 4. The fine earth fraction is loam.

The Bt horizon has hue of 2.5YR or 5YR, value of 3 or 4, and chroma of 3 to 6. The fine earth fraction is sandy loam, loam, sandy clay loam, or clay loam, 18 to 30 percent clay, and 20 to 50 percent silt. Its structure is weak or moderate, fine or medium subangular blocky.

The C horizon has hue of 10R to 5YR, value of 3 or 4, and chroma of 2 to 4. The fine earth fraction is sandy loam or loam.

Athol Series

The Athol series is fine-loamy, mixed, mesic Ultic Hapludalfs. It consists of very deep, well drained soils on undulating and rolling uplands and benches. These soils formed in loamy material formed in conglomerate derived from residuum of limestone, quartz, sandstone, and shale. Slopes range from 3 to 15 percent.

Athol soils are on the landscape with moderately deep, somewhat excessively drained Catoctin soils; well drained, very deep Lewisberry soils; moderately well drained, very deep Clarksburg soils; and somewhat poorly drained, very deep Penlaw soils. Catoctin soils are loamy-skeletal. Highfield and Lewisberry soils are coarse-loamy. Unlike Athol soils, Clarksburg soils have a fragipan.

Typical pedon of Athol gravelly silt loam, 3 to 8 percent slopes, 1 mile southwest of Fairfield in Hamilton Township, Adams County; 100 feet south of State Route 3014, about 0.5 mile east of Township Route 303, and 0.5 mile west of Pennsylvania Route 116; in a cultivated field:

Ap—0 to 10 inches; dark reddish brown (5YR 3/2) gravelly silt loam, light reddish brown (5YR 6/3) dry; weak fine granular structure; friable, slightly sticky, slightly plastic; 20 percent rock fragments; slightly acid; abrupt smooth boundary.

Bt1—10 to 24 inches; reddish brown (5YR 4/4) silt loam; moderate medium subangular blocky

structure; friable, slightly sticky, slightly plastic; few faint clay films on faces of peds and in pores; 10 percent rock fragments; slightly acid; clear wavy boundary.

Bt2—24 to 36 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable, sticky, plastic; common faint clay films on faces of peds and in pores; 10 percent rock fragments; strongly acid; clear wavy boundary.

Bt3—36 to 52 inches; reddish brown (5YR 5/4) silty clay loam; moderate medium and fine subangular blocky structure; friable, sticky, plastic; few faint clay films on faces of peds and in pores; 10 percent rock fragments; strongly acid; gradual wavy boundary.

C—52 to 60 inches; reddish brown (5YR 4/4) gravelly silt loam; massive; firm, slightly sticky, slightly plastic; 20 percent rock fragments; strongly acid.

The solum is 40 to 75 inches thick. Bedrock is at a depth greater than 60 inches. Rock fragments range from 0 to 35 percent in the solum and from 15 to 50 percent in the substratum. In unlimed areas reaction is very strongly acid to slightly acid in the upper part of the subsoil, strongly acid or moderately acid in the lower part, and strongly acid to slightly acid in the substratum.

The Ap horizon has hue of 2.5YR to 7.5YR, value of 3 or 4, and chroma of 2 to 4. The fine earth fraction is loam.

The B horizon has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 2 to 4. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam.

The C horizon has hue of 10R to 7.5YR, value of 3 to 5, and chroma of 2 to 4. The fine earth fraction is loam, sandy loam, or silt loam.

Baile Series

The Baile series is fine-loamy, mixed, mesic Typic Ochraquults. It consists of very deep, poorly drained soils on lowlands and in depressions. These soils formed in local alluvium weathered from residuum derived from mica schist. Slopes range from 0 to 3 percent.

Baile soils are on the landscape with somewhat excessively drained Catoctin, Manor, and Mt. Airy soils; well drained Chester, Glenelg, and Highfield soils; and moderately well drained Glenville soils. All these soils are redder or browner throughout than Baile soils and are on higher lying ridges and hills.

Typical pedon of Baile silt loam, 3 miles south-southwest of Hanover in Union Township, Adams County; 60 feet south of Township Route 463, about 0.7 mile southeast of intersection with Township Route 461, about 0.6 mile northwest of Legislative Route 01031; in an abandoned pasture:

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; common fine distinct very dark grayish brown (10YR 3/2) and grayish brown (10YR 5/2) mottles; weak medium and fine granular structure; friable, slightly sticky, slightly plastic; 2 percent rock fragments; slightly acid; abrupt smooth boundary.

Eg—4 to 12 inches; light brownish gray (2.5Y 6/2) silt loam; common fine prominent brown (7.5YR 4/4) and grayish brown (10YR 5/2) mottles; weak fine subangular blocky structure parting to moderate fine granular; friable, slightly sticky, slightly plastic; slightly acid; clear wavy boundary.

Btg1—12 to 18 inches; grayish brown (2.5Y 5/2) silt loam; common fine prominent gray (10YR 5/1) and reddish brown (5YR 4/4) mottles; weak fine subangular blocky structure; friable, sticky, slightly plastic; very few faint clay films on faces of peds and in pores; moderately acid; clear wavy boundary.

Btg2—18 to 34 inches; grayish brown (10YR 5/2) silt loam; common medium and fine prominent reddish brown (5YR 4/4) mottles; weak coarse prismatic structure parting to moderate medium angular blocky; firm, sticky, slightly plastic; many faint clay films on faces of peds and in pores; strongly acid; gradual wavy boundary.

Btg3—34 to 40 inches; grayish brown (10YR 5/2) silt loam; many medium prominent reddish brown (5YR 4/4) and many medium faint brown (10YR 5/3) mottles; weak medium angular and subangular blocky structure; firm, sticky, slightly plastic; common faint clay films on faces of peds and in pores; strongly acid; gradual wavy boundary.

Cg—40 to 60 inches; grayish brown (10YR 5/2) channery silt loam; many medium and fine prominent gray (5Y 5/1) and strong brown (7.5YR 5/6) mottles; massive; friable, sticky, slightly plastic; few faint clay films on rock fragments; many mica flakes; 15 percent rock fragments; strongly acid.

The solum is 30 to 40 inches thick. Bedrock is at a depth greater than 60 inches. Rock fragments range from 0 to 5 percent in the upper part of the solum and from 0 to 15 percent in the lower part and in the substratum. In unlimed areas reaction ranges from extremely acid to strongly acid.

The Ap horizon has hue of 5Y to 10YR or it is neutral; value is 2 to 4 and chroma is 0 to 2.

The Eg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 0 to 2.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 0 to 2. It has prominent mottles with chroma of 5 or 6. The fine earth fraction is clay loam, silt loam, or silty clay loam.

The C horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 0 to 4. It has prominent mottles with chroma of 5 or 6. The fine earth fraction is sandy loam, loam, or silt loam.

Bermudian Series

The Bermudian series is fine-loamy, mixed, mesic Fluventic Dystrochrepts. It consists of very deep, well drained soils on flood plains. These soils formed in alluvium weathered from residuum derived from shale, sandstone, and conglomerate on the surrounding uplands. Slopes range from 0 to 3 percent.

Bermudian soils are on flood plains with moderately well drained Rowland soils and somewhat poorly drained Bowmansville soils. Rowland and Bowmansville soils are on slightly lower rises and in swales.

Typical pedon of Bermudian silt loam, 1.5 miles southwest of York Haven, along Conewago Creek, 75 feet south of creek in East Manchester Township, York County; on State Route 1004, about 0.2 mile east of Township Route 940, and 0.2 mile west of Township Route 952; in hayland:

Ap—0 to 8 inches; dark reddish brown (5YR 3/3) silt loam, light reddish brown (5YR 6/3) dry; weak fine granular structure; very friable, nonsticky, slightly plastic; moderately acid; clear smooth boundary.

Bw1—8 to 30 inches; dark reddish brown (5YR 3/3) silt loam, light reddish brown (5YR 6/3) dry; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; strongly acid; gradual wavy boundary.

Bw2—30 to 50 inches; reddish brown (2.5YR 4/4) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; very strongly acid; clear wavy boundary.

2C—50 to 72 inches; reddish brown (2.5YR 4/4) stratified sand and gravel; single grain; loose, nonsticky, nonplastic; very strongly acid.

The solum is 34 to 52 inches thick. Depth to stratified loamy sand, sand, and gravel is 50 inches. Bedrock is at a depth greater than 72 inches. Rock fragments of sandstone gravel and, in some places, shale, range from 0 to 10 percent in the upper part of the solum, 0 to 30 percent in the lower part and in the substratum to a depth of 40 inches, and 5 to 80 percent below that depth. In unlimed areas reaction ranges from very strongly acid to moderately acid throughout.

The Ap horizon has hue of 2.5YR to 7.5YR, value of 3 or 4, and chroma of 2 to 4.

The Bw horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 3 or 4. The fine earth fraction is loam, sandy clay loam, clay loam, silt loam, or silty clay loam.

The C horizon has hue of 7.5YR to 2.5YR, value of 3 to 5, and chroma of 3 or 4. The fine earth fraction is sand, except in some pedons it is sandy loam, loam, sandy clay loam, clay loam, silt loam, or silty clay loam.

Birdsboro Series

The Birdsboro series is fine-loamy, mixed, mesic Typic Hapludults. It consists of very deep, well drained soils on stream terraces. These soils formed in old alluvium weathered from residuum derived from shale, siltstone, and sandstone. Slopes range from 0 to 15 percent.

Birdsboro soils are on the landscape with moderately well drained Raritan soils and poorly drained Croton and Lamington soils. Croton, Lamington, and Raritan soils have a fragipan.

Typical pedon of Birdsboro silt loam, 3 to 8 percent slopes, 3 miles southwest of East Berlin in Hamilton Township, Adams County; on west side of Township Route 546, about 800 feet north of Township Route 579; in cropland:

Ap—0 to 10 inches; dark reddish brown (5YR 3/3) silt loam, light reddish brown (5YR 6/3) dry; moderate medium and fine granular structure; friable, slightly sticky, slightly plastic; 7 percent rock fragments; slightly acid; abrupt smooth boundary.

Bt1—10 to 18 inches; reddish brown (2.5YR 4/4) gravelly silt loam; weak fine subangular blocky structure; friable, sticky, slightly plastic; common faint clay films on faces of peds and in pores; 15 percent rock fragments; strongly acid; clear wavy boundary.

Bt2—18 to 30 inches; reddish brown (5YR 4/4) silt loam; moderate fine angular and subangular blocky structure; friable, sticky, plastic; many faint clay films on faces of peds and in pores; 5 percent rock fragments; strongly acid; clear wavy boundary.

Bt3—30 to 40 inches; yellowish red (5YR 4/6) silty clay loam; moderate coarse angular blocky structure parting to weak medium angular and subangular blocky; firm, sticky, plastic; continuous faint clay films on faces of coarse peds and in pores; common faint clay films on faces of medium peds;

5 percent rock fragments; strongly acid; clear wavy boundary.

Bt4—40 to 50 inches; yellowish red (5YR 4/6) silty clay loam; common medium prominent red (2.5YR 4/6) and strong brown (7.5YR 5/6) mottles; weak medium and fine subangular blocky structure; firm, sticky, plastic; common faint clay films on faces of peds and in pores; 10 percent rock fragments; strongly acid; clear wavy boundary.

2C—50 to 60 inches; reddish brown (2.5YR 4/4) silt loam; weak thick platy structure; very firm, slightly sticky, slightly plastic; 10 percent rock fragments; very strongly acid.

The solum is 30 to 50 inches thick. Bedrock is at a depth greater than 60 inches. Rock fragments range from 0 to 20 percent in the solum and from 0 to 70 percent in the substratum. In unlimed areas reaction ranges from extremely acid to strongly acid throughout.

The Ap horizon has hue of 2.5YR to 10YR, value of 3 or 4, and chroma of 2 to 4.

In the upper part the Bt horizon has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 3 to 6. In the lower part it has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 3 to 6, and in some pedons it is mottled. The fine earth fraction is loam, sandy clay loam, clay loam, silt loam, or silty clay loam.

The C horizon has hue of 2.5YR to 10YR, value of 3 to 5, and chroma of 3 to 6. The fine earth fraction is loamy sand, sandy loam, loam, clay loam, or silt loam.

Bowmansville Series

The Bowmansville series is fine-loamy, mixed, nonacid, mesic Aeric Fluvaquents. They are very deep, somewhat poorly drained soils on flood plains. These soils formed in alluvium weathered from residuum derived from shale, sandstone, and conglomerate. Slopes range from 0 to 3 percent.

Bowmansville soils are on flood plains with well drained Bermudian soils and moderately well drained Rowland soils. Bowmansville and Bermudian soils are on slightly higher rises.

Typical pedon of Bowmansville silt loam, 1.5 miles southwest of Heidlersburg in Tyrone Township, Adams County; 180 feet north of Township Route 563, about 0.4 mile west of its intersection with Township Route 532; in woodland:

Ap—0 to 11 inches; dark brown (7.5YR 3/2) silt loam, pinkish gray (7.5YR 6/2) dry; moderate medium and fine granular structure; very friable, slightly sticky, slightly plastic; moderately acid; abrupt smooth boundary.

Bw—11 to 14 inches; reddish brown (5YR 4/3) silt loam; few fine prominent strong brown (7.5YR 5/6) and dark brown (7.5YR 3/2) mottles; weak thick platy structure parting to weak fine subangular blocky; friable, slightly sticky, slightly plastic; moderately acid; abrupt smooth boundary.

Bg1—14 to 20 inches; reddish gray (5YR 5/2) silt loam; common fine prominent strong brown (7.5YR 5/6) and brown (7.5YR 5/4) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; moderately acid; clear smooth boundary.

Bg2—20 to 34 inches; reddish gray (5YR 5/2) silt loam; common medium prominent strong brown (7.5YR 5/6) and (7.5YR 5/8) mottles; weak medium and fine subangular blocky structure; friable, sticky, slightly plastic; slightly acid; abrupt smooth boundary.

Cg1—34 to 55 inches; pinkish gray (5YR 6/2) stratified silt loam and silty clay loam; common medium prominent strong brown (7.5YR 5/6) and common medium distinct yellowish red (5YR 5/6) mottles; massive; firm, sticky, plastic; 1 to 10 percent rock fragments in individual strata; slightly acid becoming neutral in the lower part; abrupt smooth boundary.

2Cg2—55 to 72 inches; dark reddish gray (5YR 4/2) gravelly sandy loam; common medium and fine distinct weak red (2.5YR 5/2) and dusky red (2.5YR 3/2) mottles; massive; firm, slightly sticky, nonplastic; 25 percent rock fragments; neutral.

The solum is 24 to 40 inches thick. Stratified loamy sand, sand, and gravel are at a depth greater than 48 inches. Bedrock is at a depth greater than 72 inches. Rock fragments range from 0 to 15 percent in the solum, 0 to 30 percent in the substratum to a depth of 40 inches, and 0 to 90 percent below that depth. In unlimed areas reaction ranges from strongly acid to slightly acid in the solum and from strongly acid to neutral in the substratum.

The Ap horizon has hue of 5YR or 7.5YR; value of 3 or 4 moist, 6 or more dry; and chroma of 2 to 4.

The Bw horizon has hue similar to that of the Ap horizon.

The Bg horizon has hue of 5YR or 7.5YR, value of 3 to 6, and chroma of 2. In some subhorizons it has chroma of more than 4. The fine earth fraction is sandy clay loam, silt loam, or silty clay loam. In some pedons the horizon has thin lenses of sand, silt, clay, or gravel.

The Cg horizon has hue of 5YR to 10YR, value of 3 to 6, and chroma of 2. The fine earth fraction is sandy loam, loam, silt loam, or silty clay loam.

The 2Cg horizon has hue and chroma similar to

those of the Cg horizon. The fine earth fraction ranges from silty clay loam to sand.

Brecknock Series

The Brecknock series is fine-loamy, mixed, mesic Ultic Hapludalfs. It consists of deep, well drained soils on ridges and hills. These soils formed in channery materials weathered from residuum derived from porcelanite and hornfels, which are shale and sandstone that have been metamorphosed by diabase intrusives. Slopes range from 3 to 60 percent.

Brecknock soils are on the landscape with well drained, very deep Legore and Neshaminy soils; moderately deep, well drained Penn soils; somewhat poorly drained, deep Lehigh soils; and poorly drained, deep Croton soils. Croton soils have a fragipan.

Typical pedon of Brecknock channery silt loam, 8 to 15 percent slopes, 3 miles east of Gettysburg in Mount Pleasant Township, Adams County; 280 feet northwest of Cavalry Field Drive, 675 feet southwest of its intersection with Township Route 483; in woodland:

O—1 inch to 0; fresh and partly decomposed leaves and twigs.

A—0 to 3 inches; dark brown (10YR 3/2) channery silt loam, dark grayish brown (10YR 4/2) dry; weak medium and fine granular structure; very friable, slightly sticky, slightly plastic; 25 percent rock fragments; strongly acid; abrupt smooth boundary.

E—3 to 7 inches; dark grayish brown (2.5Y 4/2) channery silt loam; weak medium subangular blocky structure parting to weak medium granular; friable, sticky, slightly plastic; 20 percent rock fragments; very strongly acid; clear smooth boundary.

BE—7 to 12 inches; brown (10YR 4/3) channery silt loam; weak medium and fine subangular blocky structure; friable, sticky, plastic; 15 percent rock fragments; strongly acid; clear wavy boundary.

Bt1—12 to 24 inches; brown (10YR 4/3) silt loam; common fine faint dark yellowish brown (10YR 4/4) mottles; moderate medium angular and subangular blocky structure; friable, sticky, plastic; common faint clay films on faces of peds and in pores; 10 percent rock fragments; moderately acid; clear wavy boundary.

Bt2—24 to 30 inches; brown (10YR 5/3) silt loam; common fine faint brown (10YR 4/3) and yellowish brown (10YR 5/4) mottles; weak thick platy structure parting to weak fine angular and subangular blocky; firm, sticky, plastic; few faint clay films on faces of peds; common faint clay films in pores; 10 percent rock fragments; moderately acid; gradual wavy boundary.

C—30 to 42 inches; brown (10YR 5/3) very channery silt loam; massive; very firm, sticky, plastic; 40 percent rock fragments; moderately acid; clear wavy boundary.

R—42 inches; fractured porcelanite.

The solum is 24 to 40 inches thick. Bedrock is at a depth between 40 to 60 inches. Rock fragments range from 0 to 35 percent in the solum and from 15 to 70 percent in the substratum. In unlimed areas reaction ranges from very strongly acid to slightly acid throughout.

The A horizon has hue of 10YR to 2.5Y, value of 2 or 3, and chroma of 1 or 2. The fine earth fraction is silt loam.

The E horizon has hue of 10YR to 2.5Y, value of 4, and chroma of 2. The fine earth fraction is silt loam.

The Ap horizon, where it occurs, has hue of 10YR to 2.5Y, value of 3 or 4, and chroma of 2 or 3. The fine earth fraction is silt loam.

The BE horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 3 or 4. The fine earth fraction is silt loam.

The Bt horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 3 or 4. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam.

The C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 3. The fine earth fraction is loam or silt loam.

Catoctin Series

The Catoctin series is loamy-skeletal, mixed, mesic Ruptic-Alfic Eutrochrepts. It consists of moderately deep, somewhat excessively drained soils on ridges and hills. These soils formed in channery materials weathered from residuum derived from metabasalt and metarhyolite. Slopes range from 8 to 25 percent.

Catoctin soils are on the landscape with well drained, very deep Arendtsville and Edgemont soils; well drained, deep Highfield and Myersville soils; moderately well drained, very deep Glenville soils; and poorly drained Baile soils. All these soils have fewer rock fragments than Catoctin soils.

Typical pedon of Catoctin channery silt loam, 8 to 15 percent slopes, 1 mile southwest of Cashtown in Franklin Township, Adams County; south of Township Route 353, about 1,200 feet northwest of Township Route 566; in an orchard:

Ap—0 to 9 inches; dark brown (7.5YR 4/4) channery silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; 20 percent rock fragments; moderately acid; abrupt smooth boundary.

Bw—9 to 16 inches; yellowish brown (10YR 5/4) very channery silt loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few thin lenses that have few faint clay films on faces of peds and rock fragments; 50 percent rock fragments; strongly acid; gradual wavy boundary.

C—16 to 24 inches; brown (7.5YR 5/4) extremely channery silt loam; massive; friable, slightly sticky, nonplastic; 70 percent rock fragments; moderately acid; gradual irregular boundary.

R—24 inches; hard, somewhat fractured metabasalt.

The solum is 15 to 30 inches thick. Bedrock is at a depth between 20 to 40 inches. Rock fragments range from 5 to 35 percent in the A and E horizons, 15 to 55 percent in the B horizon, and 35 to 80 percent in the substratum. In unlimed areas reaction is strongly acid to slightly acid in the solum and moderately acid to neutral in the substratum.

The A horizon, where it occurs, has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 1 or 2.

The E horizon, where it occurs, has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. It is loam or silt loam. The fine earth fraction is loam or silt loam.

The Bw horizon has hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. The fine earth fraction is loam or silt loam.

The C horizon has hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. The fine earth fraction is loam or silt loam.

Chagrin Series

The Chagrin series is fine-loamy, mixed, mesic Dystric Fluventic Eutrochrepts. It consists of very deep, well drained soils on flood plains. These soils formed in alluvium weathered from residuum derived from limestone and schist on the surrounding uplands. Slopes range from 0 to 3 percent.

Chagrin soils are on flood plains with moderately well drained Lindside and Codorus soils and poorly drained Hatboro soils. Lindside, Codorus, and Hatboro soils are in areas slightly lower lying than those of Chagrin soils.

Typical pedon of Chagrin silt loam, 0.75 mile west of New Salem in West Manchester Township, York County; 800 feet southeast of unnumbered Federal road, 0.8 mile south of Township Route 492, about 0.6 mile north of Township Route 499, and 400 feet north of West Branch Codorus Creek; in cropland:

Ap—0 to 10 inches; dark brown (10YR 4/3) silt loam; moderate medium and fine granular structure; friable, slightly sticky, slightly plastic; 5 percent rock fragments; neutral; abrupt smooth boundary.

Bw1—10 to 15 inches; brown (7.5YR 5/4) silt loam; weak medium subangular blocky structure parting to weak fine subangular blocky; friable, sticky, slightly plastic; 1 percent rock fragments; neutral; clear smooth boundary.

Bw2—15 to 20 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable, sticky, slightly plastic; 1 percent rock fragments; neutral; clear smooth boundary.

Bw3—20 to 32 inches; yellowish brown (10YR 5/4) loam; weak coarse subangular blocky structure; friable, slightly sticky, slightly plastic; 2 percent rock fragments; neutral; gradual smooth boundary.

BC—32 to 36 inches; yellowish brown (10YR 5/4) sandy loam; weak coarse subangular blocky structure; friable, slightly sticky, nonplastic; common fine mica flakes; neutral; gradual smooth boundary.

C—36 to 60 inches; stratified yellowish brown (10YR 5/4) sandy loam and brown (10YR 5/3) loamy fine sand; massive; very friable, nonsticky, nonplastic; common fine mica flakes; 1 to 15 percent rock fragments in strata; slightly acid.

The solum is 24 to 48 inches thick. Bedrock is at a depth greater than 60 inches. Rock fragments range from 0 to 15 percent to a depth of 40 inches. In unlimed areas reaction ranges from moderately acid to neutral throughout.

The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. The fine earth fraction is dominantly sand loam, loam, and silt loam, but in some pedons it consists of thin horizons of clay loam and silty clay loam.

The BC horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. The fine earth fraction is sandy loam, loam, or silt loam.

The C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4. The fine earth fraction is stratified loamy fine sand, sandy loam, loam, or silt loam.

Chester Series

The Chester series is fine-loamy, mixed, mesic Typic Hapludults. It consists of very deep, well drained soils on broad ridgetops and side slopes. These soils formed in loamy material weathered from residuum derived from schist and phyllite. Slopes range from 3 to 15 percent.

Chester soils are on the landscape with somewhat

excessively drained, very deep Manor soils; somewhat excessively drained, moderately deep Mt. Airy soils; well drained, very deep Edgemont soils; well drained, deep Glenelg soils (fig. 20); very deep, moderately well drained Glenville soils; and poorly drained, very deep Baile soils. All these soils except Baile, Edgemont, Glenelg, and Glenville soils have more sand than Chester soils. Glenville soils have a fragipan.

Typical pedon of Chester silt loam, 3 to 8 percent slopes, 1 mile west of Fawn Grove in Fawn Township, York County; west of Kennard-Dale High School, 250 feet north of Pennsylvania Route 851, and 50 feet east of western boundary of field; in a cultivated field:

Ap—0 to 11 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; very friable, slightly sticky, nonplastic; 5 percent rock fragments; slightly acid; abrupt smooth boundary.

Bw—11 to 17 inches; strong brown (7.5YR 5/6) silt loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; 2 percent rock fragments; moderately acid; gradual wavy boundary.

Bt1—17 to 23 inches; strong brown (7.5YR 5/6) silty clay loam; weak fine subangular blocky structure; friable, sticky, plastic; common faint clay films on faces of peds and in pores; 5 percent rock fragments; strongly acid; gradual wavy boundary.

Bt2—23 to 28 inches; strong brown (7.5YR 5/6) silt loam; weak fine subangular blocky structure; friable, slightly sticky, plastic; common faint clay films on faces of peds and in pores; 5 percent rock fragments; strongly acid; clear wavy boundary.

Bt3—28 to 36 inches; strong brown (7.5YR 5/6) silt loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few faint clay films on faces of peds and in pores; 10 percent rock fragments; strongly acid; abrupt wavy boundary.

BC—36 to 40 inches; reddish brown (5YR 5/4) loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; micaceous; 5 percent rock fragments; strongly acid; clear wavy boundary.

C1—40 to 48 inches; strong brown (7.5YR 5/8) channery sandy loam; weak medium and thin platy structure; friable, nonsticky, nonplastic; micaceous; 25 percent rock fragments; strongly acid; gradual wavy boundary.

C2—48 to 60 inches; strong brown (7.5YR 5/8) channery sandy loam; moderate medium and thin platy structure; very friable, nonsticky, nonplastic; very micaceous; 25 percent rock fragments; very strongly acid.

The solum is 30 to 50 inches thick. The argillic horizon extends to a depth of 30 to 40 inches. Bedrock is at a depth greater than 60 inches. Rock fragments range from 0 to 15 percent in the solum. Some pedons have mica that increases with depth in the lower part of the Bt horizon. In unlimed areas reaction is strongly acid or very strongly acid throughout.

The A horizon, where it occurs, has hue of 5YR to 10YR, value of 3 or 4, and chroma of 1 or 2. The fine earth fraction is loam or silt loam.

The Ap horizon, where it occurs, has hue of 5YR to

Figure 20.—An area of Chester soils used for cultivated crops. Glenelg and Edgemont soils are in areas on the Pigeon Hills in the background.

10YR, value of 4 or 5, and chroma of 3 to 6. The fine earth fraction is loam or silt loam.

The E horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 2 to 6. The fine earth fraction is loam or silt loam.

The Bw, Bt, and BC horizons have hue of 2.5YR to 10YR, value of 3 to 6, and chroma of 4 to 8. The Bw horizon is loam or silt loam. The Bt horizon is loam, clay loam, silt loam, or silty clay loam. The BC horizon is loam, clay loam, or silt loam.

The C horizon has hue of 2.5YR to 10YR, value of 3 to 8, and chroma of 1 to 8. The fine earth fraction is sandy loam, loam, or silt loam.

Clarksburg Series

The Clarksburg series is fine-loamy, mixed, mesic Typic Fragiudalfs. It consists of very deep, moderately well drained soils on broad uplands and in depressions. These soils formed in colluvium and in the underlying loamy material weathered from residuum derived from limestone, schist, shale, and sandstone. Slopes range from 0 to 8 percent.

Clarksburg soils are on the landscape with well drained Athol, Conestoga, Duffield, and Hagerstown soils and somewhat poorly drained Penlaw soils. Like Clarksburg soils, Penlaw soils have a fragipan. Hagerstown soils are more clayey throughout.

Typical pedon of Clarksburg silt loam, 3 to 8 percent slopes, 2 miles west of Wrightsville in Hellam Township, York County; 100 feet south of U.S. Route 30, about 175 feet west of culvert, and 1.2 miles west of State Route 1016; in cropland:

Ap—0 to 8 inches; dark brown (10YR 4/3) silt loam; moderate, medium and fine granular structure; friable, slightly sticky, slightly plastic; 3 percent rock fragments; moderately acid; abrupt and smooth boundary.

Bt1—8 to 16 inches; yellowish brown (10YR 5/4) silt loam; moderate fine and very fine angular blocky and subangular blocky structure; friable, sticky, slightly plastic; common faint clay films on faces of peds and in pores; 3 percent rock fragments; strongly acid; clear wavy boundary.

Bt2—16 to 27 inches; yellowish brown (10YR 5/4) silt loam; common fine prominent brown (7.5YR 4/4) mottles; weak medium subangular blocky structure parting to moderate fine subangular blocky; friable, sticky, plastic; many faint clay films on faces of peds and in pores; 2 percent rock fragments; strongly acid; clear wavy boundary.

Bt3—27 to 32 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct grayish brown (10YR 5/2) and common fine prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure parting to moderate medium angular blocky; firm, sticky, plastic; common faint clay films on faces of blocky peds and in pores; 8 percent rock fragments; strongly acid; clear smooth boundary.

Btx1—32 to 40 inches; yellowish brown (10YR 5/4) silty clay loam; many medium and fine faint brown (10YR 5/3) and many medium and fine prominent brown (7.5YR 4/4) and grayish brown (2.5Y 5/2) mottles; weak very coarse prismatic structure parting to moderate medium and thin platy; firm, brittle, slightly sticky, slightly plastic; common faint clay films on faces of platy peds, in pores, and bridging sand grains; 5 percent rock fragments; strongly acid; abrupt smooth boundary.

Btx2—40 to 54 inches; brown (10YR 5/3) and yellowish brown (10YR 5/6) clay loam; many coarse and medium prominent grayish brown (2.5Y 5/2) and strong brown (7.5YR 5/6) mottles; moderate very coarse prismatic structure parting to moderate medium platy parting to moderate very fine angular blocky; firm, brittle, slightly sticky, slightly plastic; few faint clay films bridging sand grains and in pores; many faint silt coatings on prism faces; 10 percent rock fragments; strongly acid; clear wavy boundary.

C—54 to 60 inches; yellowish brown (10YR 5/4) very channery clay loam; few medium distinct grayish brown (10YR 5/2) mottles; massive; friable; slightly sticky, slightly plastic; 40 percent rock fragments; moderately acid.

The solum is 40 to 70 inches thick. The fragipan ranges in depth from 20 to 36 inches and bedrock is at a depth greater than 60 inches. Rock fragments range from 0 to 20 percent in the solum above the fragipan, 5 to 30 percent in the fragipan, and 5 to 80 percent in the substratum. In unlimed areas reaction ranges from strongly acid to slightly acid throughout.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It has low chroma mottles at a depth of 20 to 32 inches. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam.

The Btx horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 to 6. It has mottles with chroma of 2 or less. The fine earth fraction is clay loam or silty clay loam.

The C horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 6. It has mottles with chroma of 2 or less. The fine earth fraction is loam, clay loam, silt loam, silty clay loam, silty clay, or clay.

Codorus Series

The Codorus series is fine-loamy, mixed, mesic Fluvaquentic Dystrochrepts. It consists of very deep, moderately well drained soils on flood plains. These soils formed in alluvium weathered from residuum derived from mica schist and phyllite. Slopes range from 0 to 3 percent.

Codorus soils are on flood plains with well drained Chagrin soils and poorly drained Hatboro soils. Chagrin soils are on swells, and Hatboro soils are in swales and drainageways.

Typical pedon of Codorus silt loam, 1.5 miles east-southeast of Jacobus in York Township, York County; 200 feet southwest of State Route 2087, about 0.6 mile northwest of Pennsylvania Route 214, and 1,000 feet southeast of Pleasant Avenue; in idle land:

Ap—0 to 8 inches; dark brown (10YR 4/3) silt loam; weak fine and medium granular structure; friable, slightly sticky, slightly plastic; slightly acid; abrupt smooth boundary.

BE—8 to 12 inches; brown (10YR 5/3) and dark brown (10YR 4/3) silt loam; weak medium subangular blocky structure parting to weak fine subangular blocky; friable, sticky, slightly plastic; moderately acid; clear smooth boundary.

Bw1—12 to 20 inches; dark yellowish brown (10YR 4/4) silt loam; few fine prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable, sticky, slightly plastic; common mica flakes; moderately acid; clear smooth boundary.

Bw2—20 to 42 inches; brown (10YR 5/3) and yellowish brown (10YR 5/4) silt loam; many medium and fine distinct grayish brown (10YR 5/2) and many medium and fine prominent brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable, sticky, slightly plastic; common mica flakes; strongly acid; gradual smooth boundary.

Bw3—42 to 48 inches; brown (10YR 4/3) silt loam; many medium faint dark grayish brown (10YR 4/2) and many medium prominent reddish brown (5YR 4/4) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common mica flakes; strongly acid; gradual smooth boundary.

C1—48 to 55 inches; stratified olive brown (2.5Y 4/4) and dark grayish brown (2.5Y 4/2) silt loam; many medium and coarse prominent reddish brown (5YR 4/4) and yellowish red (5YR 4/6) mottles; massive; friable, slightly sticky, slightly plastic; many mica flakes; moderately acid; clear smooth boundary.

C2—55 to 60 inches; dark grayish brown (2.5Y 4/2) silt loam; massive; friable, slightly sticky, slightly plastic; many mica flakes; moderately acid.

The solum is 30 to 60 inches thick. Bedrock is at a depth greater than 60 inches. Rock fragments range from 0 to 15 percent in the solum, 0 to 25 percent in the substratum above 55 inches, and 0 to 70 percent below that depth. In unlimed areas reaction ranges from very strongly acid to moderately acid in the upper part of the solum and strongly acid to slightly acid in the lower part and in the substratum.

The Ap horizon has hue of 10YR, value of 3 to 6, and chroma of 2 or 3.

The BE horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 6.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. It has low chroma mottles at a depth of 24 inches. The fine earth fraction is loam, silt loam, or silty clay loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 4; generally, it is mottled. The fine earth fraction is loam or silt loam. In some pedons the C horizon contains strata of material ranging from sand and gravel to silty clay.

Conestoga Series

The Conestoga series is fine-loamy, mixed, mesic Typic Hapludalfs. It consists of very deep, well drained soils on undulating and rolling uplands. These soils formed in loamy material weathered from residuum derived from micaceous limestone and calcareous schist. Slopes range from 0 to 15 percent.

Conestoga soils are on the landscape with well drained, Duffield, Hagerstown, and Pequea soils; moderately well drained Clarksburg soils; and somewhat poorly drained Penlaw soils. Conestoga soils are more micaceous than Duffield soils. Hagerstown soils are more clayey throughout than Conestoga soils. Clarksburg and Penlaw soils have a fragipan. Pequea soils have more sand and rock fragments throughout than Conestoga soils.

Typical pedon of Conestoga silt loam, 3 to 8 percent slopes, 1.5 miles north of York New Salem in West Manchester Township, York County; 250 feet north of Township Route 492, about 1,000 feet southwest of its intersection with Pennsylvania Route 616; in cropland:

Ap—0 to 9 inches; dark brown (10YR 4/3) silt loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; 2 percent rock fragments; neutral; abrupt smooth boundary.

Bt1—9 to 17 inches; brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure parting to moderate fine subangular blocky; friable,

slightly sticky, plastic; common faint clay films on faces of peds and in pores; neutral; clear wavy boundary.

Bt2—17 to 24 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure parting to moderate fine angular blocky; friable, sticky, plastic; many faint clay films on faces of peds and in pores; dark yellowish brown (10YR 4/4) ped coatings; slightly acid; clear wavy boundary.

Bt3—24 to 40 inches; brown (7.5YR 4/4) silty clay loam; moderate medium and fine angular and subangular blocky structure; friable, sticky, plastic; many faint clay films on faces of peds and in pores; 2 percent rock fragments; slightly acid; clear wavy boundary.

C1—40 to 46 inches; variegated yellowish brown (10YR 5/4), strong brown (7.5YR 5/6), and dark yellowish brown (10YR 4/4) silt loam; massive; friable, sticky, plastic; many mica flakes; 5 percent rock fragments; moderately acid; gradual wavy boundary.

C2—46 to 60 inches; variegated brown (7.5YR 4/4 and 7.5YR 5/4) and strong brown (7.5YR 5/6) loam; massive; friable, slightly sticky, slightly plastic; many mica flakes; 10 percent rock fragments; moderately acid.

The solum is 30 to 60 inches thick. Bedrock is at a depth greater than 60 inches. Rock fragments range from 0 to 15 percent in the surface horizon, 0 to 30 percent in the solum, and 5 to 35 percent in the substratum. In unlimed areas reaction ranges from very strongly acid to neutral in the solum and from moderately acid to mildly alkaline in the substratum.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. In some pedons in the lower part the B horizon has a hue of 2.5Y. The fine earth fraction is silt loam or silty clay loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 4 to 8. The fine earth fraction is sandy loam, loam, or silt loam.

Croton Series

The Croton series is fine-silty, mixed, mesic Typic Fragiaqualfs. It consists of deep, poorly drained soils on nearly level and undulating lowlands, in depressions, and in drainageways. These soils formed in loamy material weathered from residuum derived from shale, siltstone, and fine-grained sandstone. Slopes range from 0 to 8 percent.

Croton soils are on the landscape with well drained Arendtsville, Brecknock, Klinesville, Lewisberry, and Lansdale soils; moderately well drained Readington and Reaville soils; and somewhat poorly drained Lehigh soils. These soils are in higher positions on the landscape than Croton soils.

Typical pedon of Croton silt loam, 0 to 3 percent slopes, 3 miles south of Franklintown in Washington Township, York County; 300 feet north of Township Route 861, about 0.5 mile east of State Route 4043; in idle land:

Ap—0 to 12 inches; dark reddish brown (5YR 3/3) silt loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; moderately acid; abrupt smooth boundary.

EB—12 to 14 inches; dark reddish gray (5YR 4/2) silt loam; common fine prominent weak red (2.5YR 5/2) mottles; moderate medium subangular blocky structure parting to moderate medium granular; friable, sticky, slightly plastic; strongly acid; abrupt smooth boundary.

Btg—14 to 20 inches; reddish gray (5YR 5/2) silt loam; common fine distinct reddish brown (5YR 5/3) and pinkish gray (5YR 6/2) mottles; moderate medium angular blocky structure parting to moderate fine subangular blocky; firm, sticky, plastic; common faint clay films on faces of peds and in pores; 3 percent rock fragments; strongly acid; clear smooth boundary.

Btx1—20 to 27 inches; pinkish gray (7.5YR 6/2) silt loam; many medium and fine prominent strong brown (7.5YR 5/6) and reddish brown (2.5YR 4/4) mottles; moderate coarse and very coarse prismatic structure parting to moderate coarse and medium angular blocky; very firm, brittle, sticky, plastic; many prominent silt coatings on faces of prisms and on smaller peds; many distinct clay films on faces of peds and in pores; 5 percent rock fragments; strongly acid; clear irregular boundary.

Btx2—27 to 37 inches; reddish brown (5YR 4/4) silt loam; common medium and fine prominent yellowish red (5YR 5/6) and pinkish gray (5YR 6/2) mottles; streaks and lenses of gray (N 6/0) and (5YR 6/1) silty clay; weak very coarse prismatic structure parting to moderate medium angular and subangular blocky; very firm, sticky, plastic; many prominent silt coatings on faces of peds; many faint clay films on faces of peds and in pores; 5 percent rock fragments; strongly acid; clear wavy boundary.

C—37 to 42 inches; reddish brown (2.5YR 4/4) channery silt loam; common medium and fine prominent gray (10YR 6/1) and brown (7.5YR 5/2)

mottles; massive; firm, slightly sticky, slightly plastic; 15 percent rock fragments increasing with depth; moderately acid; clear wavy boundary.

R—42 inches; fractured, weak, red (10R 4/3) siltstone.

The solum is 25 to 40 inches thick. Depth to the fragipan ranges from 15 to 25 inches. Depth to bedrock is 40 to 60 inches. Rock fragments range from 0 to 10 percent in individual horizons above the fragipan, 0 to 20 percent in the fragipan, and 10 to 35 percent in the substratum. In unlimed areas reaction is very strongly acid or strongly acid in the upper part of the solum and ranges from very strongly acid to moderately acid in the lower part and in the substratum.

The A horizon, where it occurs, has hue of 5YR to 10YR, value of 3 or 4, and chroma of 2 or 3.

The Ap horizon has hue of 5YR to 10YR, value of 3 or 4, and chroma of 2 to 4.

The EB horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 1 or 2.

The Btg horizon has hue of 5YR to 10YR, value of 4 to 7, and chroma of 0 to 2. It has prominent mottles with chroma of 5 or 6. The fine earth fraction is silt loam or silty clay loam.

The Btx horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 1 to 6. It has prominent mottles with chroma of 5 or 6. The fine earth fraction is silt loam or silty clay loam.

The C horizon has hue of 10R to 5YR, value of 3 to 5, and chroma of 2 to 4. It has prominent mottles with chroma of 5 or 6. The fine earth fraction is silt loam or silty clay loam.

Duffield Series

The Duffield series is fine-loamy, mixed, mesic Ultic Hapludalfs. It consists of very deep, well drained soils on undulating and rolling uplands. These soils formed in loamy material weathered from residuum derived from impure limestone. Slopes range from 0 to 25 percent.

Duffield soils are on the landscape with well drained, very deep Conestoga and Hagerstown soils; moderately well drained, very deep Clarksburg soils; and somewhat poorly drained, very deep Penlaw soils. Duffield soils are not as micaceous as Conestoga soils and have less clay throughout than Hagerstown soils. Unlike Duffield soils, Clarksburg and Penlaw soils have a fragipan.

Typical pedon of Duffield silt loam, 3 to 8 percent slopes, 0.25 mile north of Hallam in Hellam Township, York County; 360 feet north of Township Route 779, about 0.6 mile west of its intersection with State Route 1037; in cropland:

Ap—0 to 10 inches; dark brown (10YR 4/3) silt loam; moderate medium and fine granular structure; friable, slightly sticky, plastic; 10 percent rock fragments; neutral; abrupt smooth boundary.

Bw—10 to 16 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure parting to weak fine subangular blocky; friable, sticky, plastic; very few faint clay films on faces of peds and in pores; 5 percent rock fragments; slightly acid; clear wavy boundary.

Bt1—16 to 24 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable, sticky, plastic; few faint clay films on faces of peds and in pores; 3 percent rock fragments; slightly acid; clear wavy boundary.

Bt2—24 to 38 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure parting to moderate fine angular blocky; friable, sticky, plastic; common faint clay films on faces of peds and in pores; 3 percent rock fragments; slightly acid; gradual wavy boundary.

Bt3—38 to 44 inches; strong brown (7.5YR 5/6) silt loam; moderate fine subangular blocky structure; friable, slightly sticky, plastic; few faint clay films on faces of peds and in pores; 5 percent rock fragments; slightly acid; gradual wavy boundary.

BC—44 to 50 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure parting to weak fine subangular blocky; friable, slightly sticky, plastic; few prominent organic streaks; few iron and manganese oxides; 10 percent rock fragments; moderately acid, gradual wavy boundary.

C—50 to 60 inches; strong brown (7.5YR 5/6) channery loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; 20 percent rock fragments; strongly acid.

The solum is 40 to 70 inches thick. The argillic horizon extends to a depth of 40 inches or more. Bedrock is at a depth greater than 60 inches. Rock fragments range from 0 to 20 percent in the upper part of the solum and from 0 to 40 percent in the lower part and in the substratum. In unlimed areas reaction ranges from strongly acid to neutral in the upper part of the solum and from strongly acid to slightly acid in the lower part and in the substratum.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4.

The Bw horizon has hue of 7.5YR or 10YR, value and chroma of 4 to 6. The fine earth fraction is loam or silt loam.

In the upper part the Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. In the lower part it has hue of 7.5YR, value of 4 to 6, and

chroma of 4 to 8. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam except in some pedons, where it is silty clay or clay.

The BC horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam.

The C horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. The fine earth fraction ranges from loam to clay.

Edgemont Series

The Edgemont series is fine-loamy, mixed, mesic Typic Hapludults. It consists of very deep, well drained soils on ridges and hills. These soils formed in channery material weathered from residuum derived from quartzite, quartz schist, and conglomerate. Slopes range from 0 to 70 percent.

Edgemont soils are on the landscape with somewhat excessively drained, moderately deep Catoctin and Mt. Airy soils; well drained, very deep Chester soils; well drained, deep Glenelg and Highfield soils; and moderately well drained, very deep Glenville soils. Edgemont soils have more clay throughout than Catoctin, Highfield, and Mt. Airy soils. Chester soils are reddish throughout. Glenelg soils are micaceous. Glenville soils have a fragipan.

Typical pedon of Edgemont channery loam, 8 to 25 percent slopes, very stony, 1 mile east of Maple Grove in Paradise Township, York County; 285 feet northwest of Township Route 461 at a point 375 feet northeast of its intersection with State Route 3047; in woodland:

Oi—2 inches to 1 inch; mat of fresh and slightly decayed leaves, twigs, and roots.

Oa—1 inch to 0; decomposed organic material containing twigs, roots, and rock fragments.

A—0 to 2 inches; very dark gray (10YR 3/1) channery loam; weak fine and very fine granular structure; very friable, nonsticky, nonplastic; 20 percent rock fragments; extremely acid; abrupt wavy boundary.

E—2 to 5 inches; brown (10YR 5/3) channery loam; weak medium and fine granular structure; very friable, slightly sticky, nonplastic; 20 percent rock fragments; very strongly acid; clear wavy boundary.

BE—5 to 8 inches; yellowish brown (10YR 5/4) channery loam; weak fine angular blocky structure; very friable, slightly sticky, nonplastic; 15 percent rock fragments; very strongly acid; clear wavy boundary.

Bt1—8 to 14 inches; yellowish brown (10YR 5/4) channery loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; very few, faint clay bridges between sand grains on faces of peds and in pores; 15 percent rock fragments; extremely acid; clear wavy boundary.

Bt2—14 to 24 inches; yellowish brown (10YR 5/4) channery loam; weak medium angular blocky structure parting to weak fine angular blocky; friable, slightly sticky, slightly plastic; common faint clay bridges between sand grains and few faint clay films on faces of peds and in pores; 20 percent rock fragments; extremely acid; clear wavy boundary.

Bt3—24 to 30 inches; yellowish brown (10YR 5/6) very channery sandy loam; weak coarse subangular blocky structure parting to weak medium angular blocky; friable, nonsticky, nonplastic; very few faint clay bridges between sand grains on faces of peds; 35 percent rock fragments; extremely acid; gradual irregular boundary.

C—30 to 60 inches; brown (10YR 5/3) extremely channery sandy loam with streaks and patches of yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8); weak medium subangular blocky structure; friable, nonsticky, nonplastic; 70 percent rock fragments; extremely acid; abrupt irregular boundary.

The solum is 20 to 40 inches thick. Bedrock is at a depth greater than 60 inches. Rock fragments range from 5 to 40 percent in the solum and from 10 to 90 percent in the substratum. In unlimed areas reaction ranges from extremely acid to strongly acid throughout.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The fine earth fraction is sandy loam, loam, or silt loam.

The Ap horizon, where it occurs, has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The fine earth fraction is sandy loam, loam, or silt loam.

The E horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 0 to 4. The fine earth fraction is sandy loam, loam, or silt loam.

The BE horizon has hue of 7.5YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4. The fine earth fraction is sandy loam, loam, or silt loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. The fine earth fraction is sandy loam or loam, but the range includes fine sandy loam, sandy clay loam, or clay loam.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 to 8. The fine earth fraction is sandy loam, but the range includes loamy sand, loam, and clay loam.

Elk Series

The Elk series is fine-silty, mixed, mesic Ultic Hapludalfs. It consists of very deep, well drained soils

on stream terraces. These soils formed in old alluvium weathered from residuum derived from limestone and shale on surrounding uplands. Slopes range from 0 to 8 percent.

Elk soils are on the landscape with well drained, very deep Hagerstown soils; well drained, deep Glenelg soils; and very deep, moderately well drained Glenville soils. These soils are on ridges and hills on uplands. Elk soils are near well drained Chagrin and moderately well drained Lindside and Codorus soils on flood plains below terraces.

Typical pedon of Elk silt loam, 0 to 3 percent slopes, 1.3 miles north of York New Salem in North Codorus Township, York County; 300 feet east of Pennsylvania Route 616, about 600 feet south of West Branch Codorus Creek; in cropland:

Ap—0 to 10 inches; dark brown (10YR 4/3) silt loam; moderate medium and fine granular structure; friable, slightly sticky, slightly plastic; 3 percent rock fragments; neutral; abrupt smooth boundary.

Bw—10 to 16 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable, sticky, slightly plastic; very few faint clay films on faces of peds and lining pores; 1 percent rock fragments; neutral; clear smooth boundary.

Bt1—16 to 24 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable, sticky, slightly plastic; few faint clay films on faces of peds and in pores; 1 percent rock fragments; neutral; clear smooth boundary.

Bt2—24 to 30 inches; strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; common faint clay films on faces of peds and in pores; few mica flakes; 1 percent rock fragments; moderately acid; gradual smooth boundary.

Bt3—30 to 36 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common faint clay films on faces of peds and in pores; common mica flakes; 2 percent rock fragments; strongly acid; gradual smooth boundary.

Bt4—36 to 40 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few faint clay films on faces of peds and in pores; common mica flakes; 2 percent rock fragments; strongly acid; clear wavy boundary.

BC—40 to 48 inches; yellowish brown (10YR 5/4) silt loam; few fine faint yellowish brown (10YR 5/6) and pale brown (10YR 6/3) mottles; weak coarse subangular blocky structure; friable, slightly sticky, nonplastic; very few faint clay films on faces of peds and in pores; many mica flakes; 5 percent rock fragments; strongly acid; gradual wavy boundary.

C—48 to 60 inches; yellowish brown (10YR 5/4) gravelly silt loam; common fine faint brown (10YR 5/3) and yellowish brown (10YR 5/6) mottles; massive; friable, slightly sticky, nonplastic; many mica flakes; 25 percent rock fragments; strongly acid.

The solum is 40 to 60 inches thick. Bedrock is at a depth greater than 60 inches. Rock fragments range from 0 to 5 percent in the solum and from 0 to 35 percent in the substratum. In unlimed areas reaction ranges from very strongly acid to slightly acid throughout.

The Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. The fine earth fraction is silt loam or loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. In some pedons in the lower part it has mottles with chroma of 2 or more. The fine earth fraction is silt loam or silty clay loam, except in some pedons, where it is loam.

The C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. In some pedons it has mottles with chroma of 2 or more. The fine earth fraction is silt loam or silty clay loam, but in some pedons it contains strata of sandy loam, loam, clay loam, or silty clay.

Glenelg Series

The Glenelg series is fine-loamy, mixed, mesic Typic Hapludults. It consists of deep, well drained soils on ridgetops and side slopes. These soils formed in channery material weathered from saprolite and residuum derived from schist and phyllite. Slopes range from 3 to 25 percent.

Glenelg soils are on the landscape with somewhat excessively drained, very deep Manor soils; moderately deep Mt. Airy soils; well drained, very deep Chester and Edgemont soils; moderately well drained, very deep Glenville soils; and poorly drained, very deep Baile soils. Manor soils are coarse-loamy, and Mt. Airy soils are loamy-skeletal. Glenelg soils are redder than Chester and Edgemont soils. Unlike Glenelg soils, Glenville soils have a fragipan. Baile soils are grayish throughout.

Typical pedon of Glenelg channery silt loam, 8 to 15 percent slopes, 1 mile southwest of Brogue in Chanceford Township, York County; 200 feet east of State Route 2077, about 0.5 mile southeast of its intersection with State Route 2054; in a cultivated field:

Ap—0 to 8 inches; dark brown (7.5YR 4/4) channery silt loam; moderate fine granular structure; very friable, slightly sticky, nonplastic; 15 percent rock fragments; slightly acid; abrupt smooth boundary.

BE—8 to 12 inches; reddish brown (5YR 4/4) channery silt loam; weak medium platy structure parting to weak very fine subangular blocky; friable, slightly sticky, slightly plastic; 15 percent rock fragments; slightly acid; clear wavy boundary.

Bt1—12 to 16 inches; yellowish red (5YR 5/6) channery silt loam; weak fine subangular blocky structure; friable, sticky, plastic; common faint clay films on faces of peds and lining pores; 15 percent rock fragments; moderately acid; clear wavy boundary.

Bt2—16 to 22 inches; yellowish red (5YR 5/8) channery silty clay loam; moderate medium and fine subangular blocky structure; friable, sticky, plastic; many faint clay films on faces of peds and lining pores; 15 percent rock fragments; many mica flakes; strongly acid; clear wavy boundary.

Bt3—22 to 25 inches; yellowish red (5YR 4/8) channery silt loam; weak medium subangular blocky structure; firm, sticky, slightly plastic; common faint clay films on faces of peds, on rock fragments, and in pores; 20 percent rock fragments; many mica flakes; very strongly acid; clear wavy boundary.

BC—25 to 29 inches; yellowish red (5YR 4/8) channery loam; weak very thick platy and medium subangular blocky structure; firm, slightly sticky, slightly plastic; common faint clay films on rock fragments, few faint clay films on faces of peds and lining pores; 25 percent rock fragments; many mica flakes; very strongly acid; gradual wavy boundary.

C—29 to 50 inches; yellowish red (5YR 4/6), red (2.5YR 5/6), and light reddish brown (5YR 6/3) very channery loam; massive; 35 percent rock fragments; very micaceous; very strongly acid; abrupt wavy boundary.

Cr—50 inches; weathered fractured mica schist.

The solum is 18 to 30 inches thick. Bedrock is at a depth between 40 to 60 inches. Rock fragments range from 0 to 35 percent in the solum and from 5 to 35 percent in the substratum. In unlimed areas reaction is very strongly acid or strongly acid in the surface layer and very strongly acid to slightly acid in the subsoil and in the substratum.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 or 4. The fine earth fraction is loam or silt loam.

The BE horizon has hue of 5YR to 10YR, value of the 4 or 5, and chroma of 4 to 8. The fine earth fraction is loam or silt loam.

The Bt horizon has hue of 5YR to 10YR, value of the 4 or 5, and chroma of 4 to 8. The fine earth fraction is loam, silt loam, or silty clay loam.

The C horizon has hue of 2.5YR to 10YR, value of 4 or 5, and chroma of 2 to 8. The fine earth fraction is sandy loam or loam.

Glenville Series

The Glenville series is fine-loamy, mixed, mesic Aquic Fragiudults. It consists of very deep, moderately well drained soils in depressions and on foot slopes, benches, and lowlands. These soils formed in loamy material weathered from residuum derived from schist and other crystalline rocks containing mica. Slopes range from 0 to 8 percent.

Glenville soils are on the landscape with well drained Chester, Edgemont, Glenelg, and Highfield soils and poorly drained Baile soils. All except Baile soils are on ridges and hills. Baile soils have more gray in the subsoil than Glenville soils.

Typical pedon of Glenville silt loam, 3 to 8 percent slopes, 3 miles south-southwest of Hanover in Union Township, Adams County; 40 feet northeast of Township Route 463, about 0.1 mile northwest of its intersection with Legislative Route 01031; in cropland:

Ap—0 to 10 inches; dark brown (10YR 4/3) silt loam; moderate medium and fine granular structure; friable, sticky, slightly plastic; 5 percent rock fragments; slightly acid; abrupt smooth boundary.

Bt1—10 to 14 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct yellowish brown (10YR 5/8) and brown (10YR 5/3) mottles; moderate medium subangular blocky structure parting to moderate fine subangular blocky; friable, sticky, plastic; common faint clay films on faces of peds and lining pores; 3 percent rock fragments; slightly acid; clear wavy boundary.

Bt2—14 to 19 inches; yellowish brown (10YR 5/4) silt loam; common fine prominent strong brown (7.5YR 5/6) and light olive brown (2.5Y 5/3) mottles; moderate medium angular blocky structure parting to moderate fine angular blocky; firm, sticky, plastic; common faint clay films on faces of peds and in pores; common mica flakes; 5 percent rock fragments; slightly acid; clear wavy boundary.

Btx1—19 to 24 inches; yellowish brown (10YR 5/4) silt loam; many medium and fine prominent strong brown (7.5YR 5/6) and grayish brown (2.5Y 5/2) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; very firm, brittle, sticky, slightly plastic; many faint clay films on faces of peds and in

pores; common mica flakes; 10 percent rock fragments; moderately acid; gradual wavy boundary.

Btx2—24 to 36 inches; yellowish brown (10YR 5/6) silt loam; many medium prominent strong brown (7.5YR 5/6) and grayish brown (2.5Y 5/2) mottles; weak very coarse prismatic structure parting to moderate medium platy; very firm, brittle, sticky, slightly plastic; common faint clay films on faces of platy peds and in pores; many mica flakes; 10 percent rock fragments; very strongly acid; clear wavy boundary.

BC—36 to 40 inches; strong brown (7.5YR 5/6) channery loam; common medium prominent light brownish gray (2.5Y 6/2) mottles; weak medium subangular blocky structure; friable, slightly sticky, nonplastic; few faint clay films on faces of peds and in pores; many mica flakes; 15 percent rock fragments; very strongly acid; gradual wavy boundary.

C—40 to 60 inches; strong brown (7.5YR 5/6) channery loam parting to extremely channery loam in the lower part; few medium prominent light olive brown (2.5Y 5/4) and light brownish gray (2.5Y 6/2) mottles; weak medium platy structure; very friable, nonsticky, nonplastic; very many mica flakes; 20 percent rock fragments increasing to 65 percent in lower part; very strongly acid.

The solum is 30 to 40 inches thick. Depth to the fragipan ranges from 15 to 30 inches. Depth to bedrock is greater than 60 inches. Rock fragments range from 0 to 30 percent in the solum and from 5 to 80 percent in the substratum. In unlimed areas reaction ranges from very strongly acid to neutral in the solum and is very strongly acid or moderately acid in the substratum.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 6.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam.

The Btx horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. It has prominent mottles with chroma of 2 to 6. The fine earth fraction is loam or silt loam.

The BC horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. It has prominent mottles with chroma of 1 to 4. The fine earth fraction is loam or silt loam.

The C horizon has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 1 to 8. The fine earth fraction is sandy loam or loam.

Hagerstown Series

The Hagerstown series is fine, mixed, mesic Typic Hapludalfs. It consists of very deep, well drained soils on undulating and rolling uplands. These soils formed in clayey materials weathered from residuum derived from limestone. Slopes range from 0 to 25 percent.

Hagerstown soils are on the landscape with well drained Conestoga and Duffield soils, moderately well drained Clarksburg soils, and somewhat poorly drained Penlaw soils. Hagerstown soils have more clay throughout than Conestoga and Duffield soils. Unlike Hagerstown soils, Penlaw soils have a fragipan.

Typical pedon of Hagerstown silt loam, 0 to 3 percent slopes, 2 miles east-northeast of Thomasville in West Manchester Township, York County; 100 feet east of Township Route 500, about 0.5 mile north of its intersection with U.S. Route 30; in cropland:

Ap—0 to 10 inches; reddish brown (5YR 4/3) silt loam; moderate medium subangular blocky structure; friable, sticky, plastic; 1 percent rock fragments; neutral; abrupt smooth boundary.

Bt1—10 to 15 inches; yellowish red (5YR 4/6) silty clay; moderate medium subangular blocky structure; friable, sticky, plastic; few faint clay films on faces of peds and in pores; neutral; clear wavy boundary.

Bt2—15 to 28 inches; yellowish red (5YR 4/6) clay; moderate medium angular blocky structure; friable, very sticky, very plastic; many faint and distinct clay films on faces of peds and in pores; neutral; clear wavy boundary.

Bt3—28 to 36 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure parting to strong fine subangular blocky; firm, sticky, very plastic; many distinct clay films on faces of peds and in pores; 2 percent rock fragments; neutral; clear wavy boundary.

Bt4—36 to 42 inches; yellowish red (5YR 4/6) clay; common medium prominent yellowish brown (10YR 5/4) lenses; moderate fine subangular blocky structure; firm, sticky, very plastic; many faint and distinct clay films on faces of peds and in pores; few fine iron and manganese oxides and few prominent ped coatings; 2 percent rock fragments; neutral; gradual wavy boundary.

Bt5—42 to 53 inches; yellowish red (5YR 4/6) and strong brown (7.5YR 5/6) clay; moderate very fine subangular blocky structure; friable, very sticky, very plastic; common faint and distinct clay films on faces of peds and in pores; few fine iron and manganese oxides and few prominent ped

coatings; 1 percent rock fragments; strongly acid; gradual wavy boundary.

BCt—53 to 72 inches; yellowish red (5YR 4/6) silty clay loam; common medium prominent strong brown (7.5YR 5/6) and red (2.5YR 4/6) mottles; moderate very fine subangular blocky structure; friable, sticky, very plastic; few faint clay films on faces of peds and in pores; 1 percent rock fragments; strongly acid.

The solum is 40 to 72 inches thick. Bedrock is at a depth greater than 72 inches. Rock fragments range from 0 to 15 percent throughout. In unlimed areas reaction ranges from strongly acid to slightly acid in the upper part of the solum and from strongly acid to neutral in the lower part and in the substratum.

The Ap horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 4.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. In some pedons it has hue of 7.5YR. The fine earth fraction is silty clay loam, silty clay, or clay.

The BC horizon has hue of 2.5YR or 5YR, value of 3 to 6, and chroma of 4 to 8. The fine earth fraction is loam, silt loam, silty clay loam, silty clay, or clay.

Hatboro Series

The Hatboro series is fine-loamy, mixed, nonacid, mesic Typic Fluvaquents. It consists of very deep, poorly drained soils on flood plains. These soils formed in alluvium weathered from residuum derived from mica schist, gneiss, and other metamorphic and crystalline rocks. Slopes range from 0 to 3 percent.

Hatboro soils are on flood plains with well drained Chagrin soils and moderately well drained Codorus soils. Chagrin soils are on higher swells. Codorus soils are on slightly lower lying rises.

Typical pedon of Hatboro silt loam, 3 miles southwest of Hanover, in Conewago Township, Adams County; on north bank of South Branch Conewago Creek, 300 feet north of Township Route 461 at a point 1,300 feet northeast of its intersection with Township Route 463; in an abandoned pasture:

Ap—0 to 6 inches; dark brown (10YR 3/3) silt loam; common fine distinct very dark brown (10YR 2/2) and dark grayish brown (10YR 4/2) mottles; weak medium granular structure; friable, slightly sticky, slightly plastic; strongly acid; abrupt smooth boundary.

Eg—6 to 12 inches; light brownish gray (10YR 6/2) silt loam; many fine prominent brown (10YR 5/3) and strong brown (7.5YR 5/6) mottles; weak medium and fine granular structure; friable, slightly sticky, slightly plastic; strongly acid; clear smooth boundary.

Bg1—12 to 32 inches; grayish brown (10YR 5/2) silt loam; many fine prominent brown (10YR 5/3) and yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; friable, sticky, slightly plastic; strongly acid; clear smooth boundary.

Bg2—32 to 45 inches; light brownish gray (10YR 6/2) silt loam; many medium and fine distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; weak medium and fine subangular blocky structure; friable, sticky, slightly plastic; common mica flakes; moderately acid; abrupt smooth boundary.

Cg—45 to 60 inches; light brownish gray (2.5Y 6/2) gravelly silt loam; many medium and fine prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; massive; friable, slightly sticky, slightly plastic; many mica flakes; 30 percent rock fragments; moderately acid.

The solum is 40 to 60 inches thick. Bedrock is at a depth greater than 60 inches. Rock fragments range from 0 to 10 percent in the solum and from 0 to 80 percent in the substratum. In unlimed areas reaction ranges from very strongly acid to neutral in the solum and is moderately acid or slightly acid in the substratum.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It has prominent mottles with chroma of 5 or 6.

The Eg horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3. It has prominent mottles with chroma of 5 or 6. The fine earth fraction is loam or silt loam.

The Bg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 0 to 2. It has prominent mottles with chroma 5 or 6. The fine earth fraction is sandy clay loam, clay loam, silt loam, or silty clay loam.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 0 to 2. It has prominent mottles with chroma of 5 or 6. The fine earth fraction is sandy clay loam, sandy loam, clay loam, silty clay loam, or silt loam. In some pedons it has strata of material ranging from sand or gravel to silt or clay.

Highfield Series

The Highfield series is coarse-loamy, mixed, mesic Ultic Hapludalfs. It consists of deep, well drained soils on ridges and hills. These soils formed in channery materials weathered from residuum derived from metabasalt and metarhyolite. Slopes range from 3 to 25 percent.

The soils mapped in this survey area have a higher base saturation above bedrock than is defined for the Highfield series. This difference does not affect use and management of these soils. These soils are coarse-loamy, mixed, mesic Typic Hapludalfs.

Highfield soils are on the landscape with somewhat excessively drained, moderately deep Catoctin soils; well drained, very deep Arendtsville and Edgemont soils; well drained, deep Myersville soils; moderately well drained, very deep Glenville soils; and poorly drained, very deep Baile soils. Highfield soils have less clay in the upper part of the solum than Myersville, Edgemont, and Arendtsville soils. Baile and Glenville soils are in lower lying areas.

Typical pedon of Highfield channery silt loam, 8 to 15 percent slopes, 3.5 miles southwest of Fairfield in Hamilton Township, Adams County; 300 feet south of State Route 3021 and 0.8 mile northeast of its intersection with Pennsylvania Route 16; in an apple orchard:

Ap—0 to 9 inches; dark brown (10YR 4/3) channery silt loam; weak fine and medium granular structure; friable, nonsticky, slightly plastic; 25 percent rock fragments; slightly acid; abrupt smooth boundary.

Bt1—9 to 12 inches; yellowish brown (10YR 5/4) channery silt loam; weak fine and medium subangular structure; friable, slightly sticky, slightly plastic; 20 percent rock fragments; slightly acid; clear wavy boundary.

Bt2—12 to 18 inches; light olive brown (2.5Y 5/4) channery silt loam; moderate fine subangular blocky structure; friable, slightly sticky, slightly plastic; common faint clay films on faces of peds and in pores; 25 percent rock fragments; moderately acid; clear wavy boundary.

Bt3—18 to 24 inches; light olive brown (2.5Y 5/4) channery silt loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; common faint clay films on faces of peds and in pores; 30 percent rock fragments; strongly acid; clear wavy boundary.

Bt4—24 to 32 inches; light olive brown (2.5Y 5/4) very channery silt loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; common faint clay films on faces of peds and in pores; 35 percent rock fragments; strongly acid; gradual wavy boundary.

Bt5—32 to 38 inches; light olive brown (2.5Y 5/4) very channery silt loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few faint clay films on faces of peds and lining pores; 40 percent rock fragments; strongly acid; gradual wavy boundary.

C—38 to 42 inches; light olive brown (2.5Y 5/6) very channery silt loam; lenses of yellow (10YR 7/8) and olive brown (2.5Y 4/4); massive; firm, slightly sticky, nonplastic; 50 percent rock fragments; strongly acid; abrupt wavy boundary.

R—42 inches; pale green (5G 6/2) and gray (5G 4/1) metarhyolite.

The solum is 20 to 40 inches thick. Bedrock is at a depth between 40 to 60 inches. Rock fragments range from 5 to 25 percent in the A and E horizons, 15 to 40 percent in the Bt horizon, and 20 to 80 percent in the C horizon. In unlimed areas reaction is very strongly acid or strongly acid in the solum and strongly acid or moderately acid in the substratum.

The A horizon, where it occurs, has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2.

The E horizon, where it occurs, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 to 4. The fine earth fraction is loam or silt loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 4 to 6. The fine earth fraction is loam or silt loam.

The C horizon has hue of 7.5YR to 2.5Y, value 5 or 6, and chroma of 4 to 6. The fine earth fraction is loam or silt loam.

Klinesville Series

The Klinesville series is loamy-skeletal, mixed, mesic Lithic Dystrochrepts. It consists of shallow, somewhat excessively drained soils on ridges, side slopes, and hills. These soils formed in channery material weathered from residuum derived from shale, siltstone, and fine-grained sandstone. Slopes range from 3 to 40 percent.

Klinesville soils are on the landscape with well drained, deep Lansdale soils; well drained, moderately deep Penn and Steinsburg soils; moderately well drained, deep Readington and moderately deep Reaville soils; somewhat poorly drained, deep Lehigh soils; and poorly drained, deep Croton soils. All these soils have less sand and fewer rock fragments than Klinesville soils.

Typical pedon of Klinesville channery silt loam, in an area of Penn-Klinesville channery silt loams, 3 to 8 percent slopes, 0.25 mile east of Barlow in Mt. Joy Township, Adams County; 100 feet north of State Route 2001, about 0.25 mile east of Pennsylvania Route 134; in a cultivated field:

Ap—0 to 8 inches; reddish brown (5YR 4/4) channery silt loam; weak fine granular structure; very friable,

slightly sticky, slightly plastic; 30 percent rock fragments; strongly acid; clear smooth boundary.

Bw—8 to 14 inches; red (2.5YR 4/6) very channery silt loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; 60 percent rock fragments; strongly acid; clear wavy boundary.

C—14 to 16 inches; dark red (2.5YR 3/6) extremely channery silt loam; massive; firm, slightly sticky, slightly plastic, 80 percent rock fragments; moderately acid; clear wavy boundary.

R—16 inches; fractured weak red (10R 4/4) shale bedrock.

The solum is 10 to 20 inches thick. Bedrock is at a depth between 10 to 20 inches. Rock fragments range from 15 to 75 percent in individual horizons of the solum and from 40 to 90 percent in the substratum. In unlimed areas reaction ranges from very strongly acid to moderately acid throughout.

The Ap horizon has hue of 10R to 5YR, value and chroma of 2 to 4. The fine earth fraction is silt loam.

The Bw horizon has hue of 10R to 5YR, value of 3 or 4, and chroma of 3 to 6. The fine earth fraction is loam or silt loam.

The C horizon has hue of 10R to 5YR, value of 3 or 4, and chroma of 3 to 6. The fine earth fraction is loam or silt loam.

Lamington Series

The Lamington series is fine-loamy, mixed, mesic Typic Fragiaqults. It consists of very deep, poorly drained soils on benches and lowlands and in depressions. These soils formed in old alluvium weathered from residuum derived from shale, siltstone, and sandstone. Slopes range from 0 to 3 percent.

Lamington soils are on the landscape with well drained Birdsboro soils and moderately well drained Raritan soils. Birdsboro soils are on higher ridges and hills above Lamington soils.

Typical pedon of Lamington silt loam, 1.5 miles south of Biglerville in Butler Township, Adams County; east side of Pennsylvania Route 34 near Conewago Creek; in cropland:

Ap—0 to 8 inches; dark brown (10YR 4/2) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; moderately acid; abrupt wavy boundary.

BE—8 to 11 inches; dark reddish gray (5YR 4/2) silt loam; common fine prominent red (2.5YR 4/6) mottles; weak thick platy structure parting to weak very fine subangular blocky; friable, slightly sticky, slightly plastic; 5 percent rock fragments; moderately acid; clear wavy boundary.

Btg—11 to 17 inches; pinkish gray (5YR 7/2) silty clay loam; common fine prominent red (10R 4/6) and brown (7.5YR 5/4) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; common faint clay films on faces of peds; 5 percent rock fragments; strongly acid; abrupt wavy boundary.

Btxg1—17 to 32 inches; reddish gray (5YR 5/2) clay loam; common medium prominent light gray (N 7/0) and strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure parting to moderate thick platy and moderate medium subangular blocky; very firm, brittle, sticky, slightly plastic; few faint clay films on faces of peds; few prominent silt coatings on faces of peds; 10 percent rock fragments; strongly acid; gradual wavy boundary.

Btxg2—32 to 46 inches; pinkish gray (5YR 6/2) cobbly loam; many coarse prominent strong brown (7.5YR 5/6) and reddish brown (5YR 4/3) mottles; weak very coarse prismatic structure parting to weak coarse platy and weak medium subangular blocky; firm, sticky, slightly plastic; few distinct clay films on faces of peds; few prominent iron and manganese oxides and silt coatings on faces of peds; 20 percent rock fragments; very strongly acid; gradual wavy boundary.

2C—46 to 60 inches; stratified sand and gravel.

The solum is 40 to 60 inches thick. Depth to the fragipan ranges from 15 to 30 inches; the fragipan extends to a depth of 40 inches or more. Depth to bedrock is greater than 60 inches. Rock fragments range from 0 to 15 percent in the upper part of the solum, 0 to 25 percent in the lower part, and 0 to 90 percent in the substratum. In unlimed areas reaction is very strongly acid or strongly acid throughout.

The Ap horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 1 or 2. The fine earth fraction is silt loam or loam.

Where present, a BA or EB horizon, has hue of 5YR to 10YR, value of 4 to 6, and chroma of 2. The fine earth fraction is silt loam.

The BE horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 1 or 2. The fine earth fraction is silt loam.

The Btg horizon has hue of 5YR to 10YR, value of 4 to 7, and chroma of 1 or 2. It has few to many prominent mottles. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam.

The Btxg horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 1 to 8. It has few to many prominent mottles. The fine earth fraction is loam, clay loam, or silt loam.

The 2C horizon has hue of 2.5YR to 10YR, value of 4

to 6, and chroma of 1 to 8. It is stratified sand and gravel, but it ranges to silty clay loam.

Lansdale Series

The Lansdale series is coarse-loamy, mixed, mesic Typic Hapludults. It consists of deep, well drained soils on broad, undulating uplands and on ridgetops and side slopes on dissected uplands. These soils formed in loamy material weathered from residuum derived from sandstone and conglomerate. Slopes range from 3 to 15 percent.

Lansdale soils are on the landscape with somewhat excessively drained, shallow Klinesville soils; well drained, very deep Lewisberry soils; well drained, moderately deep Penn and Steinsburg soils; moderately well drained, deep Readington and moderately deep Reaville soils; and poorly drained, deep Croton soils. All these soils have less sand and fewer rock fragments throughout than Lansdale soils.

Typical pedon of Lansdale loam, 3 to 8 percent slopes, 1.5 miles southwest of Manchester in East Manchester Township, York County; 60 feet northeast of Township Route 941, about 0.1 mile southeast of Interstate 83 and 0.2 mile southeast of Pennsylvania Route 921; in a cultivated field:

Ap—0 to 10 inches; dark brown (10YR 4/3) loam; moderate medium and fine granular structure; friable, slightly sticky, slightly plastic; 5 percent rock fragments; moderately acid; abrupt smooth boundary.

Bt1—10 to 17 inches; dark yellowish brown (10YR 4/4) loam; weak medium subangular blocky structure parting to fine subangular blocky; friable, slightly sticky, slightly plastic; few faint clay bridges between sand grains on faces of peds and in pores; 5 percent rock fragments; strongly acid; clear wavy boundary.

Bt2—17 to 24 inches; yellowish brown (10YR 5/6) sandy loam; moderate coarse subangular blocky structure parting to moderate medium subangular blocky; friable, slightly sticky, slightly plastic; common faint clay bridges between sand grains and clay films on faces of peds and in pores; 5 percent rock fragments; strongly acid; clear wavy boundary.

Bt3—24 to 30 inches; yellowish brown (10YR 5/6) sandy loam; weak medium and fine subangular blocky structure; very friable, slightly sticky, nonplastic; few faint clay bridges between sand grains, on faces of peds, and in pores; 5 percent rock fragments; strongly acid; clear wavy boundary.

C1—30 to 42 inches; yellowish brown (10YR 5/6) loamy sand; single grain; very friable, nonsticky, nonplastic; 5 percent rock fragments; strongly acid; gradual wavy boundary.

C2—42 to 47 inches; yellowish brown (10YR 5/6) channery loamy sand; single grain; loose, nonsticky, nonplastic; 35 percent rock fragments; strongly acid; abrupt smooth boundary.

R—47 inches; fractured dark grayish brown (10YR 4/2) sandstone.

The solum is 20 to 40 inches thick. Bedrock is at a depth between 40 to 60 inches. Rock fragments range from 2 to 25 percent in the solum and generally increase with depth in the substratum. In unlimed areas reaction is very strongly acid or strongly acid.

The Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 or 3. The fine earth fraction is sandy loam or loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. The fine earth fraction is sandy loam or loam.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. The fine earth fraction is loamy sand, sandy loam, or loam.

Legore Series

The Legore series is fine-loamy, mixed, mesic Ultic Hapludalfs. It consists of very deep, well drained soils on ridges and hills. These soils formed in channery residuum derived from diabase. Slopes range from 3 to 25 percent.

Legore soils are on the landscape with well drained, very deep Neshaminy and deep Brecknock soils; somewhat poorly drained, deep Lehigh and very deep Mount Lucas soils; and poorly drained, very deep Watchung soils. Neshaminy soils are on higher ridges and hills above Legore soils. Legore soils have a solum thicker than Brecknock soils. Lehigh, Mount Lucas, and Watchung soils are on lower lying ridgetops and along drainageways.

Typical pedon of Legore channery silt loam, 3 to 8 percent slopes, 1 mile southwest of Franklintown, Franklin Township, York County; on south side of Township Route 853, about 800 feet northeast of Township Route 860; in hayland:

Ap—0 to 8 inches; dark yellowish brown (10YR 3/4) channery silt loam; moderate medium granular structure; very friable, slightly sticky, slightly plastic; 15 percent rock fragments; neutral; abrupt smooth boundary.

E—8 to 10 inches; brown (7.5YR 4/4) silt loam; weak fine subangular blocky structure; friable, sticky,

plastic; 5 percent rock fragments; neutral; clear wavy boundary.

Bt1—10 to 21 inches; yellowish red (5YR 4/6) silty clay loam; moderate medium and fine subangular blocky structure; friable, sticky, very plastic; common faint clay films on faces of peds and in pores; 5 percent rock fragments; slightly acid; clear wavy boundary.

Bt2—21 to 30 inches; strong brown (7.5YR 5/6) and yellowish red (5YR 4/6) silty clay loam; moderate medium subangular blocky structure; firm, sticky, plastic; common faint clay films on faces of peds and in pores; 5 percent rock fragments; slightly acid; clear wavy boundary.

C1—30 to 44 inches; strong brown (7.5YR 5/6) loam; massive; firm, slightly sticky, slightly plastic; common prominent black (5YR 2/1) streaks; 5 percent rock fragments; slightly acid; gradual wavy boundary.

C2—44 to 60 inches; strong brown (7.5YR 5/6) sandy loam; multicolored sand grains; massive; firm, nonsticky, nonplastic; 5 percent rock fragments; slightly acid.

The solum is 20 to 34 inches thick. Bedrock is at a depth greater than 60 inches. Rock fragments range from 3 to 35 percent throughout. In unlimed areas reaction is strongly acid to slightly acid in the upper part of the solum and is moderately acid or slightly acid in the lower part and in the substratum.

The A and Ap horizons have hue of 5YR to 10YR, value of 3 or 4, and chroma of 2 to 4. The fine earth fraction is silt loam.

The E horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 3 or 4. The fine earth fraction is loam, silt loam, or silty clay loam.

The Bt horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 2 to 6. The fine earth fraction is clay loam or silty clay loam.

The C horizon has hue of 7.5YR to 10YR, value of 4 or 5, and chroma of 4 to 8. The fine earth fraction is sandy loam, loam, silt loam, or silty clay loam.

Lehigh Series

The Lehigh series is fine-loamy, mixed, mesic Aquic Hapludalfs. It consists of deep, somewhat poorly drained soils on ridgetops, side slopes, and hills. These soils formed in channery material weathered from residuum derived from hornfels and porcelanite, which is shale and sandstone that have been metamorphosed by diabase intrusives. Slopes range from 0 to 25 percent.

Lehigh soils are on the landscape with somewhat excessively drained, shallow Klinesville soils; well drained, very deep Legore and deep Brecknock soils; moderately well drained, deep Readington soils; somewhat poorly drained, very deep Mount Lucas soils; and poorly drained, deep Croton and very deep Watchung soils. All these except Croton and Watchung soils are redder or browner throughout than Lehigh soils. Unlike Lehigh soils, Croton and Watchung soils have bright colored mottles in the upper part of the solum. Mount Lucas soils formed in residuum derived from weathered diabase.

Typical pedon of Lehigh channery silt loam, 3 to 8 percent slopes, 0.5 mile east of Gettysburg in Straban Township, Adams County; on Benner Hill, 375 feet south of Pennsylvania Route 116, and 80 feet west of Benner Drive; in cropland:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) channery silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; 20 percent rock fragments; neutral; abrupt wavy boundary.

Bt1—8 to 14 inches; dark grayish brown (2.5Y 4/2) channery silt loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; common faint clay films on faces of peds and in pores; 15 percent rock fragments; moderately acid; abrupt wavy boundary.

Bt2—14 to 21 inches; dark grayish brown (2.5Y 4/2) channery silty clay loam; common medium distinct olive brown (2.5Y 4/4) mottles; moderate medium subangular blocky structure; firm, sticky, plastic; many faint clay films on faces of peds and in pores; 15 percent rock fragments; strongly acid; clear wavy boundary.

Bt3—21 to 30 inches; dark gray (10YR 4/1) channery silt loam; common fine prominent olive brown (2.5Y 4/4) mottles; moderate coarse and medium subangular blocky structure; firm, sticky, plastic; many distinct clay films on faces of peds, rock fragments, and in pores; 30 percent rock fragments; strongly acid; gradual wavy boundary.

C1—30 to 36 inches; dark gray (N 4/0) extremely channery silt loam; common fine prominent olive brown (2.5Y 4/4) mottles; weak medium and fine subangular blocky structure and massive; firm, sticky, slightly plastic; few faint clay films on rock fragments; 60 percent rock fragments; moderately acid; gradual wavy boundary.

C2—36 to 42 inches; very dark gray (N 3/0) extremely channery silt loam; massive; firm, slightly sticky, slightly plastic; 80 percent rock fragments; moderately acid; gradual wavy boundary.

R—42 inches; very dark gray (N 3/0) porcelanite.

The solum is 20 to 40 inches thick. Bedrock is at a depth between 40 to 60 inches. Rock fragments range

from 0 to 45 percent in the surface layer, 5 to 60 percent in the subsoil, and 25 to 80 percent in the substratum. In unlimed areas reaction is very strongly acid to neutral.

The Ap horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 3. The fine earth fraction is silt loam.

The Bt horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 0 to 4. It is mottled at a depth of 10 to 18 inches below the surface. The fine earth fraction is silt loam or silty clay loam.

The C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 0 to 3. The fine earth fraction is silt loam or silty clay loam.

Lewisberry Series

The Lewisberry series is coarse-loamy, mixed, mesic Ultic Hapludalfs. It consists of very deep, well drained soils on undulating uplands, ridges, and hills. These soils formed in loamy and stony materials weathered from residuum derived from sandstone and conglomerate. Slopes range from 3 to 25 percent.

Lewisberry soils are on the landscape with well drained, very deep Athol, deep Lansdale, and moderately deep Penn and Steinsburg soils; moderately well drained, deep Readington soils; and poorly drained, deep Croton soils. All these except Steinsburg soils have more clay and less sand in the solum than Lewisberry soils. Steinsburg soils have more rock fragments throughout than Lewisberry soils.

Typical pedon of Lewisberry gravelly sandy loam, very stony, in an area of Lewisberry and Lansdale soils, 8 to 25 percent slopes, very stony, 1.25 miles west of Lewisberry, Fairview Township, York County; 600 feet south of Township Route 927, about 2,700 feet west of Township Route 926; in woodland:

Oi—2 inches to 1 inch; mixed hardwood leaf litter.

Oe—1 inch to 0; dark reddish brown (5YR 2/2) organic mat of partly decomposed leaves and twigs; extremely acid; abrupt wavy boundary.

A—0 to 3 inches; dark reddish brown (5YR 3/2) gravelly sandy loam; weak very fine granular structure; very friable, nonsticky, nonplastic; 20 percent rock fragments; very strongly acid; abrupt wavy boundary.

E—3 to 12 inches; reddish brown (5YR 4/3) gravelly sandy loam; weak fine granular structure; very friable, nonsticky, nonplastic; 20 percent rock fragments; very strongly acid; clear irregular boundary.

BE—12 to 18 inches; reddish brown (5YR 5/4) gravelly sandy loam; weak fine subangular blocky structure; friable; very few faint clay films on faces of peds; 30 percent rock fragments; very strongly acid; clear irregular boundary.

Bt1—18 to 35 inches; reddish brown (2.5YR 4/4) gravelly sandy loam; moderate medium subangular blocky structure; firm, sticky, slightly plastic; common faint clay films on faces of peds, lining pores, and bridging sand grains; 30 percent rock fragments; very strongly acid; clear wavy boundary.

Bt2—35 to 46 inches; reddish brown (2.5YR 4/4) very gravelly sandy loam; weak medium subangular blocky structure; firm, sticky, slightly plastic; common faint clay films on faces of peds, lining pores, and bridging sand grains; 45 percent rock fragments; very strongly acid; clear irregular boundary.

C—46 to 62 inches; weak red (10R 4/3) extremely gravelly sandy loam; massive; friable, slightly sticky, nonplastic; 80 percent rock fragments; strongly acid; clear irregular boundary.

R—62 inches; dusky red (10R 3/3) conglomerate.

The solum is 40 to 60 inches thick. Depth to bedrock is greater than 60 inches. Rock fragments range from 4 to 40 percent in the upper part of the solum, 20 to 50 percent in the lower part, and generally 50 percent or more in the substratum. Rock fragments are mainly water-rounded pebbles, cobbles, and stones of white to pink quartz ranging in diameter from 1/8 inch to more than 1 foot; in some places rock fragments are angular, reddish sandstone. In unlimed areas reaction ranges from very strongly acid to moderately acid in the solum, generally because of less acid in the substratum. Base saturation increases with depth.

The A horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 2 to 6. The fine earth fraction is sandy loam or loam.

Areas that have been tilled or heavily grazed have an Ap horizon that has hue of 5YR or 7.5YR, value of 3 or 4, and chroma of 2 to 4. The fine earth fraction is sandy loam.

The E horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 2 to 6. The fine earth fraction is sandy loam or loam.

The BE horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 to 6. The fine earth fraction is sandy loam or loam.

The Bt horizon has hue of 10R to 5YR, value of 3 to 5, and chroma of 3 or 4. The fine earth fraction is sandy loam or loam.

The C horizon has hue of 10R to 5YR, value of 3 to 5, and chroma of 2 to 4. The fine earth fraction is loamy sand, sandy loam, or loam.

Lindside Series

The Lindside series is fine-silty, mixed, mesic Fluvaquentic Eutrochrepts. It consists of very deep, moderately well drained soils on flood plains. These soils formed in alluvium weathered from residuum derived from limestone, schist, shale, and sandstone on the surrounding uplands. Slopes range from 0 to 3 percent.

Lindside soils are on flood plains with well drained Chagrin soils. Unlike Chagrin soils, Lindside soils have gray mottles in the lower part of the solum.

Typical pedon of Lindside silt loam, 1.5 miles north of New Salem, West Manchester Township, York County; south of Township Route 492, about 900 feet west of Pennsylvania Route 616; in an idle field:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium and fine granular structure; friable, slightly sticky, slightly plastic; neutral, abrupt smooth boundary.

Bw1—8 to 17 inches; brown (10YR 4/3) silt loam; few medium faint yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure parting to moderate fine subangular blocky; friable, sticky, slightly plastic; neutral; clear smooth boundary.

Bw2—17 to 20 inches; brown (10YR 5/3) silt loam; common fine distinct grayish brown (10YR 5/2) and prominent strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable, sticky, slightly plastic; neutral; clear wavy boundary.

Bw3—20 to 31 inches; brown (10YR 5/3) silt loam; many medium distinct dark grayish brown (10YR 4/2) and prominent reddish brown (5YR 4/4) mottles; weak fine subangular block structure; firm, sticky, plastic; very dark grayish brown (10YR 3/2) silt loam lenses; mildly alkaline; clear wavy boundary.

C1—31 to 45 inches; brown (10YR 5/3) silt loam; many medium distinct grayish brown (10YR 5/2) and prominent yellowish red (5YR 4/6) mottles; massive; firm, sticky, slightly plastic; neutral; gradual wavy boundary.

C2—45 to 60 inches; brown (10YR 5/3) and (10YR 4/3) silt loam; common medium faint grayish brown (10YR 5/2) and common medium prominent yellowish red (5YR 4/6) mottles; massive; firm, sticky, slightly plastic; slightly acid.

The solum is 25 to 50 inches thick. Depth to bedrock is greater than 60 inches. Rock fragments range from 0 to 5 percent to a depth of 40 inches and 0 to 30 percent below that depth. In unlimed areas reaction ranges from strongly acid to mildly alkaline in the solum and from moderately acid to mildly alkaline in the substratum.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6. It has common to many low chroma mottles at a depth of 14 to 24 inches. The fine earth fraction is dominantly silt loam or silty clay loam, but in some pedons it has strata of sandy loam, loam, or clay loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 4. It has few to many prominent mottles. The fine earth fraction is sandy loam, loam, clay loam, silt loam, or silty clay loam.

Manor Series

The Manor series is coarse-loamy, micaceous, mesic Typic Dystrochrepts. It consists of very deep, somewhat excessively drained soils on ridgetops, side slopes, and hillsides on dissected uplands. These soils formed in channery material weathered from residuum from schist and phyllite. Slopes range from 3 to 60 percent.

Manor soils are on the landscape with moderately deep, somewhat excessively drained Mt. Airy soils; very deep, well drained Chester soils; and deep, well drained Glenelg soils. Mt. Airy soils have more rock fragments throughout than Manor soils. All these except Mt. Airy soils have more clay throughout than Manor soils.

Typical pedon of Manor channery loam, in an area of Mt. Airy and Manor soils, 15 to 25 percent slopes, 1.5 miles north of Fawn Grove in Fawn Township, York County; in southeast corner of intersection of State Route 2057 and Township Road 587; in woodland:

A—0 to 4 inches; dark brown (7.5YR 3/2) channery loam; weak fine granular structure; very friable, slightly sticky, nonplastic; micaceous; 20 percent rock fragments; moderately acid; clear wavy boundary.

E—4 to 8 inches; brown (7.5YR 5/4) channery loam; weak thin platy and very fine granular structure; very friable, slightly sticky, nonplastic; micaceous; 20 percent rock fragments; moderately acid; clear wavy boundary.

Bw1—8 to 18 inches; strong brown (7.5YR 5/6) channery silt loam; weak fine subangular blocky structure; very friable, slightly sticky, slightly

plastic; micaceous; 20 percent rock fragments; moderately acid; gradual wavy boundary.

Bw2—18 to 24 inches; reddish yellow (7.5YR 6/8) channery loam; weak fine subangular blocky structure; very friable, nonsticky, nonplastic; very micaceous; 20 percent rock fragments; moderately acid; clear wavy boundary.

C—24 to 60 inches; reddish yellow (7.5YR 6/6) channery loam; weak medium and thin platy structure; very friable, nonsticky, nonplastic; black coatings on some faces of peds below a depth of 36 inches; very micaceous; 20 percent rock fragments; strongly acid.

The solum is 15 to 35 inches thick. Bedrock is at a depth greater than 60 inches. Rock fragments range from 0 to 30 percent throughout. Mica is throughout and increases with depth. In unlimed areas reaction ranges from extremely acid to moderately acid.

The A horizon has hue of 5YR to 10YR, value of 3 or 4, and chroma of 1 to 4. The fine earth fraction is loam or silt loam.

The Ap horizon, where it occurs, has hue of 5YR to 10YR, value of 4, and chroma of 1 to 4. The fine earth fraction is loam or silt loam.

The E horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 to 6. The fine earth fraction is loam or silt loam.

The Bw horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 8. The fine earth fraction is loam or silt loam.

The C horizon has hue of 10R to 10YR, value of 4 to 8, and chroma of 2 to 8. The fine earth fraction is sandy loam or loam.

Mount Lucas Series

The Mount Lucas series is fine-loamy, mixed, mesic Aquic Hapludalfs. It consists of very deep, somewhat poorly drained soils on nearly level and undulating, broad uplands and foot slopes and in depressions. These soils formed in loamy material weathered from residuum derived from diabase. Slopes range from 0 to 8 percent.

Mount Lucas soils are on the landscape with well drained Neshaminy and Legore soils, somewhat poorly drained Lehigh soils, and poorly drained Watchung soils. All these except Legore and Neshaminy soils have matrix colors of lower chroma than Mount Lucas soils. Watchung soils are in lower lying areas.

Typical pedon of Mount Lucas silt loam, 3 to 8 percent slopes, 0.25 mile southwest of Franklintown in Franklin Township, York County; 100 feet north of Township Route 853, about 0.2 mile southwest of Pennsylvania Route 194, and 0.2 mile northwest of Township Route 889; in hayland:

Ap—0 to 8 inches; dark brown (10YR 4/3) silt loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; 10 percent rock fragments; neutral; abrupt smooth boundary.

Bt1—8 to 16 inches; brown (7.5YR 5/4) silty clay loam; many fine prominent grayish brown (10YR 5/2) and many fine distinct strong brown (7.5YR 5/6) mottles; weak medium and fine subangular blocky structure; friable, sticky, plastic; common distinct clay films on faces of peds and in pores; 5 percent rock fragments; slightly acid; gradual wavy boundary.

Bt2—16 to 31 inches; brown (7.5YR 5/4) channery clay loam; many medium prominent grayish brown (10YR 5/2) and many fine faint strong brown (7.5YR 5/6) mottles; weak very coarse prismatic structure parting to weak medium platy; firm, sticky, slightly plastic; common distinct clay films on faces of peds and in pores; 15 percent rock fragments; slightly acid; clear wavy boundary.

Bt3—31 to 37 inches; brown (10YR 5/4) channery clay loam; many fine prominent grayish brown (10YR 5/2) and many fine faint strong brown (7.5YR 5/6) mottles; weak thick platy structure parting to weak fine subangular blocky; firm, sticky, slightly plastic; common distinct clay films on faces of peds and in pores; 25 percent rock fragments; slightly acid; clear wavy boundary.

C1—37 to 44 inches; brown (10YR 5/3) channery loam and sandy loam; many fine prominent very dark brown (10YR 2/2), brown (10YR 4/3), and dark yellowish brown (10YR 4/4) mottles; massive; firm, sticky, slightly plastic; 20 percent rock fragments; slightly acid; gradual wavy boundary.

C2—44 to 60 inches; yellowish brown (10YR 5/4) sandy loam; massive; firm, slightly sticky, nonplastic; 5 percent rock fragments; slightly acid.

The solum is 25 to 50 inches thick. Depth to bedrock is greater than 60 inches. Rock fragments range from 0 to 30 percent in the solum and from 5 to 60 percent in the substratum. In unlimed areas reaction ranges from strongly acid to slightly acid in the upper part of the solum, strongly acid to neutral in the lower part, and moderately acid to neutral in the substratum.

The Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4.

The Bt horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 to 6. Low chroma mottles are in the upper 10 inches of the Bt horizon. The fine earth fraction is sandy clay loam or clay loam.

The C horizon has hue of 7.5YR or 10YR, value of 4

or 5, and chroma of 3 to 6. It has few to many prominent mottles. The fine earth fraction is loamy sand, sandy loam, loam, or silt loam.

Mt. Airy Series

The Mt. Airy series is loamy-skeletal, micaceous, mesic Typic Dystrochrepts. It consists of moderately deep, somewhat excessively drained soils on ridgetops, side slopes, and hillsides on dissected uplands. These soils formed in channery materials weathered from residuum derived from schist and phyllite. Slopes range from 3 to 60 percent.

The Mt. Airy soils are on the landscape with somewhat excessively drained, very deep Manor soils; well drained, very deep Chester and Edgemont and deep Glenelg soils; and poorly drained, very deep Baile soils. Manor soils are in positions on the landscape similar to those of Mt. Airy soils. Chester and Glenelg soils are in higher lying positions on the landscape. Baile soils are on lowlands.

Typical pedon of Mt. Airy channery silt loam, in an area of Mt. Airy and Manor soils, 8 to 15 percent slopes, on Pennsylvania State Game Lands No. 181, about 1.5 miles east of Airville in Lower Chanceford Township, York County, 225 feet southeast of Township Road 653 on lower access road at a point 65 feet south of access road; in a cultivated field:

Ap—0 to 8 inches; dark brown (10YR 4/3) channery silt loam; weak fine granular structure; friable, slightly sticky, and nonplastic; 25 percent rock fragments; moderately acid; abrupt smooth boundary.

Bw1—8 to 15 inches; yellowish brown (10YR 5/6) channery silt loam; weak medium and fine subangular blocky structure; friable, slightly sticky, slightly plastic; micaceous; 30 percent rock fragments; moderately acid; clear wavy boundary.

Bw2—15 to 20 inches; strong brown (7.5YR 5/6) very channery silt loam; weak medium subangular blocky structure parting to fine subangular blocky; friable, slightly sticky, slightly plastic; very micaceous; 40 percent rock fragments; moderately acid; clear wavy boundary.

C1—20 to 24 inches; brown (7.5YR 5/4) extremely channery loam; weak fine and very fine subangular blocky structure; very friable, slightly sticky, slightly plastic; very micaceous; 65 percent rock fragments; strongly acid; gradual wavy boundary.

C2—24 to 32 inches; yellowish brown (10YR 5/4) extremely channery loam; massive, very friable, nonsticky, nonplastic; very micaceous; 85 percent rock fragments; strongly acid; clear wavy boundary.

R—32 inches; fractured mica schist.

The solum is 15 to 36 inches thick. Bedrock is at a depth between 20 to 40 inches. Rock fragments range from 45 to 75 percent in the solum and from 50 to 95 percent in the substratum. Mica, evident throughout the soil, generally increases with depth. In unlimed areas reaction is very strongly acid or strongly acid.

The A horizon, where it occurs, has hue of 7.5YR to 2.5Y, value of 3 or 6, and chroma of 1 to 4.

The Ap horizon has hue of 7.5YR to 2.5Y, value of 3 or 4, and chroma of 1 to 4.

The E horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6. The fine earth fraction is loam or silt loam.

The B horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 6. The fine earth fraction is loam or silt loam.

The C horizon has hue of 5YR to 10YR, value of 5 to 7, and chroma of 4 to 6. The fine earth fraction is loam or clay loam.

Murrill Series

The Murrill series is fine-loamy, mixed, mesic Typic Hapludults. It consists of very deep, well drained soils on foot slopes and benches. These soils formed in loamy colluvium weathered from residuum derived from sandstone and shale overlying weathered limestone. Slopes range from 3 to 15 percent.

Murrill soils are on the landscape with well drained Edgemont, Conestoga, and Duffield soils and moderately well drained Clarksburg soils. All these except Edgemont soils have a higher base saturation than Murrill soils. Unlike Murrill soils, Clarksburg soils have a fragipan.

Typical pedon of Murrill gravelly loam, 3 to 8 percent slopes, 3 miles northeast of Hanover in Heidelberg Township, York County; on east side of Township Route 388, about 0.1 mile north of its intersection with State Route 3072, and 300 feet north of bend in road; in cropland:

Ap—0 to 10 inches; dark brown (10YR 4/3) gravelly loam; moderate medium and fine granular structure; friable, slightly sticky, slightly plastic; 25 percent rock fragments; slightly acid; abrupt smooth boundary.

Bw—10 to 18 inches; strong brown (7.5YR 5/6) gravelly loam; moderate medium subangular blocky structure; friable, sticky, slightly plastic; very few faint clay films in pores; 20 percent rock fragments; slightly acid; clear wavy boundary.

Bt1—18 to 28 inches; strong brown (7.5YR 5/6) channery loam; moderate medium subangular blocky structure parting to moderate fine subangular blocky; friable, sticky, slightly plastic;

few faint clay films on faces of peds and in pores; 30 percent rock fragments; moderately acid; clear wavy boundary.

Bt2—28 to 36 inches; yellowish red (5YR 5/6) channery clay loam; moderate medium subangular blocky structure; friable, sticky, plastic; common faint clay films on faces of peds and in pores; 25 percent rock fragments; strongly acid; clear wavy boundary.

2Bt3—36 to 42 inches; red (2.5YR 4/6) channery clay loam; moderate medium angular blocky structure parting to moderate fine angular blocky; firm, sticky, plastic; common faint clay films on faces of peds and in pores; 15 percent rock fragments; very strongly acid; clear wavy boundary.

2Bt4—42 to 48 inches; yellowish red (5YR 5/6) channery silty clay loam; moderate very thick platy structure parting to moderate coarse and medium angular blocky; firm, sticky, plastic; common distinct clay films on faces of peds and in pores; many prominent black (5YR 2/1) coatings on rock fragments and faces of peds; 20 percent rock fragments; very strongly acid; clear wavy boundary.

2Bt5—48 to 58 inches; yellowish red (5YR 5/6) silty clay loam; common medium prominent red (2.5YR 4/6), yellowish red (5YR 4/6), and black (5YR 2/1) mottles; few prominent lenses of red (2.5YR 4/6) silty clay loam; weak medium subangular blocky structure; firm, sticky, plastic; common faint clay films on faces of peds and in pores; 10 percent rock fragments; very strongly acid; gradual wavy boundary.

2BC—58 to 72 inches; strong brown (7.5YR 5/6) clay loam; streaks and lenses of red (2.5YR 4/6) silty clay loam; weak medium subangular blocky structure; firm, sticky, plastic; very few faint clay films on faces of peds and in pores; 10 percent rock fragments; very strongly acid.

The solum is 60 inches or more in thickness. Bedrock is at a depth greater than 72 inches. The rock fragments range from 10 to 30 percent in the upper part of the solum and from 0 to 40 percent in the lower part. In unlimed areas reaction ranges from very strongly acid to moderately acid throughout.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. The fine earth fraction is loam.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. The fine earth fraction is loam.

The Bt horizon to a depth of 36 inches has hue of 5YR to 10YR and value and chroma of 4 to 6. The fine earth fraction is loam, sandy clay loam, clay loam, silt loam, or silty clay loam.

The 2BC horizon has hue of 2.5YR to 10YR, value of 3 to 6, and chroma of 4 to 6. It has many prominent mottles. The fine earth fraction is clay loam, silty clay loam, or silty clay.

Myersville Series

The Myersville series is fine-loamy, mixed, mesic Ultic Hapludalfs. It consists of deep, well drained soils on ridges and hills. These soils formed in loamy material weathered from residuum derived from metabasalt and metarhyolite. Slopes range from 8 to 25 percent.

Myersville soils are on the landscape with somewhat excessively drained Catoctin soils and well drained Highfield soils. Catoctin and Highfield soils have more rock fragments and sand throughout than Myersville soils.

Typical pedon of Myersville silt loam, in an area of Highfield, Catoctin, and Myersville soils, 8 to 25 percent slopes, very stony; 2 miles south of Mt. Hope in Hamiltonban Township, Adams County; west of Township Route 300, south of Copper Run, 4,800 feet north of Township Route 305; in a tree plantation:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; 10 percent rock fragments; slightly acid; clear smooth boundary.

Bt1—9 to 14 inches; yellowish red (5YR 5/6) silty clay loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few faint clay films on faces of peds; 10 percent rock fragments; strongly acid; clear wavy boundary.

Bt2—14 to 27 inches; yellowish red (5YR 4/6) channery silty clay loam; moderate medium subangular blocky structure; friable, slightly sticky, plastic; common distinct clay films and common prominent black coatings on faces of peds; 15 percent rock fragments; strongly acid; gradual wavy boundary.

Bt3—27 to 38 inches; yellowish red (5YR 5/6) channery silt loam; weak fine subangular blocky structure; friable, slightly sticky, plastic; few faint clay films and common prominent black coatings on faces of peds; 15 percent rock fragments; strongly acid; gradual irregular boundary.

C—38 to 48 inches; yellowish brown (10YR 5/4) and reddish brown (5YR 4/3) channery loam; massive; friable, slightly sticky, nonplastic; 30 percent rock fragments; strongly acid; abrupt smooth boundary.

Cr—48 to 60 inches; highly weathered metabasalt; moderately acid.

The solum is 20 to 40 inches thick. Depth to rippable bedrock ranges from 40 to 60 inches or more. Depth to hard bedrock is greater than 60 inches. Rock

fragments range from 0 to 35 percent in the upper part of the solum, 3 to 50 percent in the lower part, and 5 to 75 percent in the substratum. In unlimed areas reaction is very strongly acid to moderately acid.

The A horizon, where it occurs, has hue of 10YR to 5YR and value and chroma of 2 or 3.

The Ap horizon has hue of 10YR to 5YR, value of 3 or 4, and chroma of 2 to 4.

The E horizon, where it occurs, has hue of 10YR to 5YR, value of 4 or 5, and chroma of 3 or 4.

The Bt horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam, but the range includes loam and clay loam.

The C horizon has hue of 5YR to 2.5Y, value of 4 to 7, and chroma of 2 to 8. It is multicolored. Rock fragments are highly weathered and easily crushed. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam.

Neshaminy Series

The Neshaminy series is fine-loamy, mixed, mesic Ultic Hapludalfs. It consists of very deep, well drained soils on ridges and hills (fig. 21). These soils formed in channery or bouldery materials weathered from residuum derived from diabase. Slopes range from 3 to 45 percent.

Neshaminy soils are on the landscape with well drained, very deep Legore and deep Brecknock soils; somewhat poorly drained, very deep Mount Lucas soils; and poorly drained, very deep Watchung soils. Neshaminy soils are redder than Brecknock soils and have a thicker solum. All these soils are in lower lying positions on the landscape.

Typical pedon of Neshaminy channery silt loam, 8 to 25 percent slopes, extremely bouldery, in York Haven, York County; on west side of State Route 1015, about 0.1 mile northwest of Pennsylvania Route 382; in woodland:

Oi—2 inches to 1 inch; mat of fresh and partly decayed leaves and twigs.

Oe—1 inch to 0; black (10YR 2/1) decayed organic material containing twigs and roots.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) channery silt loam; moderate medium and fine granular structure; very friable, slightly sticky, slightly plastic; 20 percent rock fragments; moderately acid; abrupt smooth boundary.

E—4 to 8 inches; brown (7.5YR 4/4) channery silt

Figure 21.—An area of Neshaminy soils used as woodland on Nells Hill. The soils are on the landscape with Legore soils, middle ground, and Mount Lucas soils, foreground.

loam; moderate fine granular structure; very friable, slightly sticky, slightly plastic; 20 percent rock fragments; moderately acid; clear wavy boundary.

BE—8 to 15 inches; strong brown (7.5YR 5/6) channery silt loam; moderate fine subangular blocky structure; friable, sticky, plastic; 15 percent rock fragments; moderately acid; gradual wavy boundary.

Bt1—15 to 29 inches; yellowish red (5YR 5/6) clay loam; moderate medium subangular blocky structure; friable, sticky, plastic; common faint clay films and very few prominent black coatings on faces of peds and rock fragments; 10 percent rock fragments; very strongly acid; gradual wavy boundary.

Bt2—29 to 34 inches; yellowish red (5YR 4/6) channery clay loam; moderate medium subangular blocky structure; friable, sticky, very plastic; many distinct clay films and common prominent black coatings on faces of peds and on rock fragments; 15 percent rock fragments; strongly acid; clear wavy boundary.

Bt3—34 to 46 inches; yellowish red (5YR 4/6) clay loam; moderate coarse subangular blocky structure; firm, sticky, plastic; common distinct clay films and common prominent black coatings on faces of peds, pores, and rock fragments; 10 percent rock fragments; strongly acid; gradual wavy boundary.

Bt4—46 to 55 inches; yellowish red (5YR 4/6) clay loam; weak coarse subangular blocky structure; firm, sticky, plastic; few faint clay films and few prominent black coatings on faces of peds, pores, and rock fragments; 10 percent rock fragments; moderately acid; clear wavy boundary.

C—55 to 72 inches; reddish brown (5YR 4/4) clay loam; multicolored sand grains; massive; firm, sticky, plastic; few faint films in pores; 5 percent rock fragments; slightly acid.

The solum is 40 to 60 inches thick. Depth to bedrock is greater than 72 inches. Rock fragments range from 0 to 40 percent in individual horizons in the upper part of the solum and from 0 to 60 percent in the lower part and in the substratum. In unlimed areas reaction ranges from very strongly acid to moderately acid in the upper part of the solum and from strongly acid to slightly acid in the lower part and in the substratum.

The A horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 1 to 3. The fine earth fraction is silt loam.

The Ap horizon, where it occurs, has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. The fine earth fraction is silt loam.

The E horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4. The fine earth fraction is loam or silt loam.

The BE horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 6. The fine earth fraction is loam, sandy clay loam, clay loam, silt loam, or silty clay loam.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 8. The fine earth fraction is loam, sandy clay loam, clay loam, silt loam, or silty clay loam.

The C horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 4 to 6. The fine earth fraction is sandy loam, loam, sandy clay loam, clay loam, or silt loam.

Penlaw Series

The Penlaw series is fine-silty, mixed, mesic Aquic Fragiudalfs. It consists of very deep, somewhat poorly drained soils on broad uplands, in depressions, and on lowlands. These soils formed in loamy colluvium weathered from residuum derived from limestone, schist, shale, and sandstone. Slopes range from 0 to 3 percent.

Penlaw soils are on the landscape with well drained Athol, Conestoga, Duffield, and Hagerstown soils and moderately well drained Clarksburg soils. All these soils are redder or browner throughout than Penlaw soils.

Typical pedon of Penlaw silt loam, 2.5 miles northeast of Littlestown in Union Township, Adams County; 80 feet east of State Route 3016, about 1.5 miles northwest of its intersection with Pennsylvania Route 194; in cropland:

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable, sticky, slightly plastic; 5 percent rock fragments; neutral; abrupt smooth boundary.

Bt1—10 to 13 inches; yellowish brown (10YR 5/6) silty clay loam; many fine distinct brown (10YR 5/3) and many fine prominent strong brown (7.5YR 5/6) mottles; moderate fine subangular blocky structure parting to moderate very fine angular blocky; friable, sticky, plastic; few faint clay films on faces of peds and in pores; 3 percent rock fragments; neutral; clear wavy boundary.

Bt2—13 to 20 inches; yellowish brown (10YR 5/6) silty clay loam; many medium and fine distinct grayish brown (10YR 5/2) and many medium and fine prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable, sticky, plastic; common faint clay films on faces of peds and in pores; many prominent ped

coatings; 1 percent rock fragments; neutral; abrupt smooth boundary.

Btx1—20 to 26 inches; yellowish brown (10YR 5/6) gravelly silt loam; many medium and fine distinct grayish brown (10YR 5/2) and many medium and fine faint yellowish brown (10YR 5/8) mottles; weak very coarse prismatic structure parting to moderate medium subangular blocky; very firm, brittle, sticky, plastic; many faint clay films on faces of peds and in pores; many common distinct coatings on faces of prisms; 20 percent rock fragments; neutral; gradual wavy boundary.

Btx2—26 to 38 inches; yellowish brown (10YR 5/6) silty clay loam; common medium and fine distinct grayish brown (10YR 5/2) and common medium and fine faint yellowish brown (10YR 5/8) mottles; weak very coarse prismatic structure parting to moderate medium angular blocky; very firm, brittle, sticky, plastic; many faint clay films on faces of peds and in pores; common distinct coatings on faces of prisms; 3 percent rock fragments; neutral; gradual wavy boundary.

Btx3—38 to 47 inches; yellowish brown (10YR 5/6) gravelly silt loam; many medium and fine distinct brown (10YR 5/3) and many medium and fine prominent strong brown (7.5YR 5/6) mottles; weak very coarse prismatic structure parting to weak medium subangular blocky; firm, brittle, sticky, plastic; common faint clay films on faces of peds and in pores; 25 percent rock fragments; neutral; gradual wavy boundary.

C—47 to 60 inches; yellowish brown (10YR 5/4) gravelly silt loam; massive; firm, sticky, slightly plastic; few clay films on rock fragments; 30 percent rock fragments; neutral.

The solum is 40 to 60 inches thick. Depth to the fragipan ranges from 15 to 30 inches and depth to bedrock is greater than 60 inches. Rock fragments range from 0 to 10 percent in the solum above the fragipan and from 0 to 30 percent in the fragipan and in the substratum. In unlimed areas reaction ranges from moderately acid to neutral throughout.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 or 3.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 to 8. It has low chroma mottles within 16 inches of the soil surface. It is silt loam or silty clay loam.

The Btx horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. It has few to many prominent mottles. The fine earth fraction is silt loam or silty clay loam.

The C horizon has hue of 5YR to 10YR, value of 2 to 6, and chroma of 2 to 8. The fine earth fraction is loam, clay loam, silt loam, silty clay loam, silty clay, or clay.

Penn Series

The Penn series is fine-loamy, mixed, mesic Ultic Hapludalfs. They are moderately deep, well drained soils on broad, undulating uplands, hills, and ridges. These soils formed in loamy materials weathered from residuum derived from shale, siltstone, and fine-grained sandstone. Slopes range from 0 to 50 percent.

Penn soils are on the landscape with somewhat excessively drained, shallow Klinesville soils; well drained, very deep Lewisberry soils; and deep, well drained Brecknock and Lansdale soils. Klinesville soils are loamy-skeletal. Lansdale and Lewisberry soils are coarse-loamy.

Typical pedon of Penn silt loam, 3 to 8 percent slopes, 1.25 miles south of Dover in Dover Township, York County; north of State Route 4008, about 0.75 mile east of its intersection with State Route 4002; in a cultivated field:

Ap—0 to 9 inches; dark reddish brown (5YR 3/3) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; 5 percent rock fragments; neutral; abrupt wavy boundary.

Bt1—9 to 14 inches; reddish brown (2.5YR 4/4) silt loam; weak fine subangular blocky structure; friable, sticky, slightly plastic; few faint clay films on faces of peds and lining pores; 5 percent rock fragments; slightly acid; clear wavy boundary.

Bt2—14 to 21 inches; dusky red (10R 3/4) silt loam; moderate medium and fine subangular blocky structure; firm, sticky, plastic; common faint clay films on faces of peds and in pores; 5 percent rock fragments; strongly acid; gradual wavy boundary.

Bt3—21 to 24 inches; dusky red (10R 3/4) silt loam; weak thick platy structure parting to moderate fine angular blocky; firm, sticky, plastic; many distinct clay films on faces of peds and in pores; 5 percent rock fragments; strongly acid; clear wavy boundary.

BC—24 to 30 inches; dusky red (10R 3/4) channery silt loam; weak medium and fine subangular blocky structure; firm, sticky, slightly plastic; very few faint clay films on faces of peds, rock fragments, and in pores; 25 percent rock fragments; strongly acid; gradual wavy boundary.

C—30 to 38 inches; dusky red (10R 3/4) very channery silt loam; weak thick platy and fine subangular blocky structure; very firm, slightly sticky, slightly plastic; very few faint clay films on rock fragments; 60 percent rock fragments; strongly acid; abrupt wavy boundary.

Cr—38 to 49 inches; highly weathered, fractured dusky red (10R 3/4) siltstone.

R—49 inches; somewhat fractured dusky red (10R 3/4) siltstone bedrock.

The solum is 17 to 34 inches thick. Depth to bedrock is between 20 to 40 inches. Rock fragments range from 5 to 40 percent in individual horizons of the solum and from 30 to 90 percent in the substratum. In unlimed areas reaction ranges from extremely acid to strongly acid in the upper part of the solum, strongly acid or moderately acid in the lower part of the solum, and strongly acid to slightly acid in the substratum.

The Ap horizon has hue of 10R to 7.5YR, value of 3 or 4, and chroma of 2 to 4. The fine earth fraction is loam or silt loam.

The E horizon, where it occurs, has hue of 10R to 7.5YR, value of 4 or 5, and chroma of 3 or 4. The fine earth fraction is loam or silt loam.

The Bt horizon has hue of 10R to 5YR and value and chroma of 3 or 4. The fine earth fraction is loam, silt loam, or silty clay loam.

The BC horizon has hue of 10R to 5YR and value and chroma of 3 or 4. The fine earth fraction is loam or silt loam.

The C horizon has hue of 10R to 5YR and value and chroma of 3 or 4. The fine earth fraction is sandy loam, loam, or silt loam.

Pequea Series

The Pequea series is coarse-loamy, mixed, mesic Typic Eutrochrepts. It consists of deep, well drained soils on ridgetops and side slopes. These soils formed in residuum derived from micaceous limestone, graphitic phyllite, and calcareous schist. Slopes range from 3 to 25 percent.

Pequea soils are on the landscape with well drained Conestoga soils. Pequea soils have less clay in the solum than Conestoga soils.

Typical pedon of Pequea silt loam, 3 to 8 percent slopes, 0.7 mile northeast of East Prospect in Lower Windsor Township, York County; 100 feet east of Township Route 792, about 400 feet north of Township Route 760; in hayland:

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam, pale brown (10YR 6/2) dry; weak fine granular structure; very friable, slightly sticky, slightly plastic; 5 percent rock fragments; neutral; abrupt smooth boundary.

Bw—8 to 24 inches; brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; 10 percent rock fragments; neutral; clear wavy boundary.

C1—24 to 40 inches; brown (10YR 4/3) and very dark grayish brown (10YR 3/2) very micaceous channery loam; weak medium platy structure; friable, nonsticky, nonplastic; 20 percent rock fragments; neutral; gradual wavy boundary.

C2—40 to 59 inches; very dark grayish brown (10YR 3/2) very micaceous channery sandy loam; massive; friable, nonsticky, nonplastic; 30 percent rock fragments; neutral; gradual wavy boundary.

R—59 inches; very dark gray (10YR 3/1) micaceous schist.

The solum is 16 to 35 inches thick. Depth to bedrock is between 40 and 60 inches. Rock fragments range from 0 to 30 percent in the solum and from 10 to 40 percent in the substratum. In unlimed areas reaction is slightly acid or neutral in the solum and from neutral to moderately alkaline in the substratum. Mica content varies and increases with depth.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 to 4.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 2 to 4, and chroma of 1 to 4. The fine earth fraction is sandy loam, loam, or silt loam.

The C horizon has hue of 5Y to 10YR, value of 3 or 4, and chroma of 1 or 2. The fine earth fraction is sandy loam or loam.

Raritan Series

The Raritan series is fine-loamy, mixed, mesic Aquic Fragiudults. It consists of very deep, moderately well drained soils on stream terraces. These soils formed in old alluvium weathered residuum derived from shale, siltstone, and sandstone. Slopes range from 0 to 8 percent.

Raritan soils are on the landscape with well drained Birdsboro soils and poorly drained Lamington soils. Birdsboro and Lamington soils are on uplands.

Typical pedon of Raritan silt loam, 3 to 8 percent slopes, 1 mile southwest of Kralltown in Washington Township, York County; 40 feet west of Township Route 852, about 800 feet northwest of its intersection with State Route 4012; in idle land:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; 5 percent rock fragments; slightly acid; abrupt smooth boundary.

BE—9 to 14 inches; strong brown (7.5YR 5/6) silt loam; weak medium and fine subangular blocky structure; friable, sticky, slightly plastic; 3 percent rock fragments; moderately acid; clear wavy boundary.

Bt1—14 to 20 inches; yellowish red (5YR 5/6) silt loam;

moderate fine angular blocky structure; friable, sticky, plastic; common faint clay films on faces of peds and in pores; 3 percent rock fragments; moderately acid; clear wavy boundary.

Bt2—20 to 26 inches; yellowish red (5YR 5/6) silty clay loam; common fine prominent pinkish gray (7.5YR 6/2) and red (2.5YR 5/6) and common fine faint yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure parting to moderate fine angular blocky; firm, sticky, plastic; many faint and distinct clay films on faces of peds and in pores; 2 percent rock fragments; strongly acid; abrupt smooth boundary.

Btx1—26 to 36 inches; strong brown (7.5YR 5/6) clay loam; common fine distinct pinkish gray (7.5YR 6/2) and common fine prominent reddish brown (5YR 5/4) and red (2.5YR 5/6) mottles; weak very coarse prismatic structure parting to moderate medium and fine angular blocky; very firm, brittle, sticky, plastic; common faint and distinct clay films on faces of peds and in pores; 5 percent rock fragments; very strongly acid; clear wavy boundary.

Btx2—36 to 44 inches; brown (7.5YR 5/4) silty clay loam; common medium and fine distinct pinkish gray (7.5YR 6/2) and common medium and fine prominent reddish brown (5YR 5/4) and red (2.5YR 5/6) mottles; moderate very coarse prismatic structure parting to moderate medium and fine angular blocky; very firm, brittle, sticky, plastic; common faint and distinct clay films on faces of peds and in pores; 3 percent rock fragments; very strongly acid; clear wavy boundary.

Btx3—44 to 48 inches; reddish brown (5YR 5/4) silty clay loam; common medium and fine prominent light brownish gray (10YR 6/2) and red (2.5YR 5/6) and common medium and fine faint yellowish red (5YR 5/6) mottles; moderate very coarse prismatic structure parting to moderate medium angular and subangular blocky; very firm, brittle, sticky, plastic; common faint clay films on faces of peds and in pores; 3 percent rock fragments; very strongly acid; gradual wavy boundary.

BC—48 to 54 inches; brown (7.5YR 5/4) clay loam; common fine prominent light brownish gray (10YR 6/2) and red (2.5YR 5/6) and common fine faint strong brown (7.5YR 5/6) mottles; weak very coarse prismatic structure parting to weak medium subangular blocky; firm, sticky, plastic; few faint clay films on faces of peds and in pores; 7 percent rock fragments; very strongly acid; gradual wavy boundary.

C—54 to 60 inches; reddish brown (5YR 4/4) stratified gravelly loam and gravelly clay loam; few fine prominent light brownish gray (10YR 6/2), strong brown (7.5YR 5/6), and red (2.5YR 5/6) mottles; weak medium subangular blocky structure; friable, sticky, slightly plastic; 15 percent rock fragments; very strongly acid.

The solum is 42 to 56 inches thick. Depth to the fragipan ranges from 20 to 30 inches. Depth to bedrock is greater than 60 inches. Rock fragments range from 0 to 15 percent in the solum and from 0 to 50 percent in the substratum. In unlimed areas reaction ranges from very strongly acid to moderately acid throughout.

The Ap horizon has hue of 5YR to 10YR, value of 3 or 4, and chroma of 2 to 4.

The BE horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 3 to 6. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 3 to 6. It has low chroma mottles at a depth of 14 to 24 inches. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam.

The Btx horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 2 to 6. It has few to many prominent mottles. The fine earth fraction is loam, sandy clay loam, clay loam, silt loam, or silty clay loam.

The BC horizon has hue of 2.5YR to 10YR, value of 3 to 5, and chroma of 2 to 4. It has few to many prominent mottles. The fine earth fraction is loam, sandy clay loam, clay loam, silt loam, or silty clay loam.

The C horizon has hue of 2.5YR to 10YR, value of 3 to 5, and chroma of 2 to 4. It has have few to many prominent mottles. It is stratified gravelly loam and gravelly clay loam, but the range includes silty clay loam to sand and gravel.

Readington Series

The Readington series is fine-loamy, mixed, mesic Typic Fragiudalfs. It consists of deep, moderately well drained soils on nearly level and undulating, broad ridgetops, in depressions, and in drainageways. These soils formed in loamy material weathered residuum derived from shale, siltstone, and fine-grained sandstone. Slopes range from 0 to 8 percent.

Readington soils are on the landscape with somewhat excessively drained Klinesville soils; well drained Arendtsville, Lansdale, and Lewisberry soils; moderately well drained Reaville soils; somewhat poorly drained Lehigh soils; and poorly drained Croton soils. Both Readington and Croton soils have a fragipan.

Typical pedon of Readington silt loam, 0 to 3 percent slopes, 1 mile southwest of Heidlersburg in Tyrone

Township, Adams County; 70 feet west of Township Route 532, about 0.1 mile north of its intersection with Township Route 563; in cropland:

Ap—0 to 10 inches; dark reddish gray (5YR 4/2) silt loam; moderate fine granular structure; friable, slightly sticky, slightly plastic; 5 percent rock fragments; slightly acid; abrupt smooth boundary.

BE—10 to 14 inches; reddish brown (5YR 4/3) silt loam; weak medium subangular blocky structure parting to weak fine and very fine subangular blocky; friable, sticky, slightly plastic; 2 percent rock fragments; slightly acid; clear wavy boundary.

Bt1—14 to 25 inches; reddish brown (5YR 5/3) silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; friable, sticky, plastic; common faint clay films on faces of peds and in pores; 5 percent rock fragments; very strongly acid; clear wavy boundary.

Bt2—25 to 27 inches; reddish brown (5YR 4/3) silt loam; common fine distinct reddish gray (5YR 5/2) and common fine faint reddish brown (5YR 4/4) mottles; weak coarse prismatic structure parting to moderate medium angular blocky; friable, sticky, plastic; common faint clay films on faces of peds and in pores; 5 percent rock fragments; slightly acid; abrupt wavy boundary.

Btx1—27 to 35 inches; weak red (2.5YR 4/2) channery silt loam; common fine prominent pinkish gray (5YR 6/2), yellowish red (5YR 5/6), and reddish brown (5YR 5/3) mottles; moderate very coarse prismatic structure parting to moderate medium angular blocky parting to moderate thick platy and fine subangular blocky; very firm, brittle, sticky, plastic; many faint clay films on faces of peds and in pores; common prominent coatings on faces of peds and rock fragments; 20 percent rock fragments; strongly acid; clear wavy boundary.

Btx2—35 to 40 inches; weak red (2.5YR 4/2) very channery silt loam; common fine distinct pale red (2.5YR 6/2) and reddish brown (2.5YR 4/4) mottles; moderate very coarse prismatic structure parting to weak thick platy and fine subangular blocky; very firm, brittle, sticky, slightly plastic; common faint clay films on faces of peds and in pores; 40 percent rock fragments; strongly acid; clear wavy boundary.

C—40 to 46 inches; weak red (10YR 4/2) extremely channery silt loam; few fine prominent pale red (10R 6/2) mottles; weak thick platy rock structure; very firm, slightly sticky, nonplastic; 75 percent rock fragments; moderately acid; abrupt wavy boundary.

R—46 inches; weak red (10R 4/2) partly weathered, fractured siltstone.

The solum is 35 to 60 inches thick. Depth to the fragipan ranges from 20 to 36 inches. Depth to bedrock is between 40 to 60 inches. Rock fragments range from 0 to 20 percent in the upper part of the solum and from 10 to 50 percent in the lower part. In unlimed areas reaction ranges from extremely acid to slightly acid in the upper part of the solum and from strongly acid to slightly acid in the lower part and in the substratum.

The Ap horizon has hue of 2.5YR to 10YR, value of 3 or 4, and chroma of 2 to 4.

The BE horizon has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 3 or 4. The fine earth fraction is loam, silt loam, or silty clay loam.

The Bt horizon has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 3 to 6. It has few to many prominent mottles at a depth of 25 inches. The fine earth fraction is loam, silt loam, or silty clay loam.

The Btx horizon has hue of 10R to 5YR, value of 3 or 4, and chroma of 2 to 6. It has few to many prominent mottles. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam.

The C horizon has hue of 10R to 7.5YR, value of 3 or 4, and chroma of 2 to 4. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam.

Reaville Series

The Reaville series is fine-loamy, mixed, mesic Aquic Hapludalfs. It consists of moderately deep, moderately well drained soils on nearly level to rolling ridgetops, on side slopes, and in depressions. These soils formed in loamy materials weathered from residuum derived from shale, siltstone, and fine-grained sandstone. Slopes range from 3 to 15 percent.

Reaville soils are on the landscape with somewhat excessively drained, shallow Klinesville soils; well drained, deep Lansdale and moderately deep Penn soils; deep, moderately well drained Readington soils; and poorly drained, deep Croton soils. Klinesville soils are loamy-skeletal, and Lansdale soils are coarse-loamy. Penn soils have a redder solum than that of Reaville soils. Readington soils have a fragipan, and Croton soils are grayish throughout.

Typical pedon of Reaville channery silt loam, 3 to 8 percent slopes, 5 miles southwest of Gettysburg in Freedom Township; north of Township Route 327, about 1/8 mile west of its intersection with Township Route 328; in cropland:

Ap—0 to 9 inches; reddish brown (5YR 4/3) channery silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; 15 percent rock fragments; slightly acid, clear smooth boundary.

Bt1—9 to 13 inches; reddish brown (2.5YR 4/4) channery silt loam; few fine prominent light reddish

brown (5YR 6/3) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; few faint clay films on faces of peds; 20 percent rock fragments; slightly acid; clear wavy boundary.

Bt2—13 to 15 inches; reddish brown (2.5YR 4/4) channery silt loam; common fine prominent yellowish red (5YR 5/8) and reddish gray (5YR 5/2) mottles; moderate medium subangular blocky structure parting to weak medium platy; firm, slightly sticky, slightly plastic; common distinct clay films on faces of peds; 30 percent rock fragments; slightly acid; clear wavy boundary.

C—15 to 25 inches; dusky red (10R 3/4) very channery silt loam; common fine prominent reddish gray (5YR 5/2) mottles; massive; firm, slightly sticky, slightly plastic; 50 percent rock fragments; slightly acid; gradual wavy boundary.

R—25 inches; weak red (10R 4/4) interbedded shale and siltstone.

The solum is 12 to 24 inches thick. Depth to bedrock is between 20 to 40 inches. Rock fragments range from 2 to 45 percent in individual horizons in the solum and from 30 to 70 percent in the substratum. In unlimed areas reaction ranges from strongly acid to slightly acid throughout.

The Ap horizon has hue of 2.5YR to 7.5YR, value of 3 or 4, and chroma of 2 to 4. The fine earth fraction is silt loam.

The Bt horizon has hue of 10R to 5YR, value of 4 to 6, and chroma of 3 or 4. It has few to many prominent mottles in the uppermost 10 inches of the argillic horizon. The fine earth fraction is silt loam or silt clay loam.

The C horizon has hue of 10R to 5YR, value of 3 or 4, and chroma of 2 to 4. The fine earth fraction is loam, silt loam, or silty clay loam.

Rowland Series

The Rowland series is fine-loamy, mixed, mesic Fluvaquentic Dystrochrepts. It consists of very deep, moderately well drained soils on flood plains. These soils formed in alluvium weathered from residuum derived from shale, siltstone, sandstone, and conglomerate. Slopes range from 0 to 3 percent.

Rowland soils are on flood plains with well drained Bermudian soils and somewhat poorly drained Bowmansville soils. Bermudian soils are redder throughout than Rowland soils and are on slightly higher lying swells. Bowmansville soils are more grayish throughout than Rowland soils and are on slightly lower lying rises.

Typical pedon of Rowland silt loam, 3 miles west of Littlestown in Mount Joy Township, Adams County; in a streambank along Plum Creek near the intersection of Township Routes 430 and 429; in a pasture:

Ap—0 to 10 inches; dark reddish brown (5YR 3/4) silt loam; weak fine granular structure; very friable, slightly sticky, slightly plastic; moderately acid; abrupt smooth boundary.

Bw1—10 to 16 inches; reddish brown (5YR 4/4) silt loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; moderately acid; clear wavy boundary.

Bw2—16 to 28 inches; reddish brown (5YR 5/4) silt loam; common fine prominent brown (7.5YR 5/2) and light gray (10YR 7/2) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; strongly acid; clear wavy boundary.

C1—28 to 44 inches; weak red (2.5YR 5/2) silty clay loam; common medium prominent brown (7.5YR 5/4) and gray (N 5/0) mottles; massive; firm, sticky, plastic; few faint silt and clay films in pores; 10 percent rock fragments; moderately acid; clear wavy boundary.

2C2—44 to 60 inches; weak red (2.5YR 5/2) stratified sand and gravel; massive; firm, nonsticky, nonplastic; moderately acid.

The solum is 24 to 40 inches thick. Depth to stratified loamy sand, sand, and gravel ranges from 40 to 60 inches. Depth to bedrock is greater than 60 inches. Rock fragments range from 0 to 10 percent in the solum, 0 to 25 percent in the substratum to a depth of 40 inches, and 30 to 90 percent below that depth. In unlimed areas reaction ranges from very strongly acid to moderately acid throughout.

The Ap horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 2 to 4.

The Bw horizon has hue of 2.5YR to 7.5YR, value of 3 to 6, and chroma of 3 to 8. It has few to many prominent mottles at a depth of 24 inches or less. The fine earth fraction is loam, sandy clay loam, clay loam, silt loam, or silty clay loam.

The C horizon has hue of 2.5YR to 7.5YR, value of 3 to 6, and chroma of 2 to 8. It has few to many prominent mottles. The fine earth fraction is sandy loam, loam, sandy clay loam, clay loam, silt loam, or silty clay loam. In many pedons at a depth of 40 inches or more it contains strata of loamy sand, sand, and gravel.

Steinsburg Series

The Steinsburg series is coarse-loamy, mixed, mesic Typic Dystrochrepts. It consists of moderately

deep, well drained soils on ridgetops, side slopes, and hills. These soils formed in channery materials weathered from residuum derived from sandstone. Slopes range from 8 to 25 percent.

These soils have a higher base saturation in the solum than is defined for the Steinsburg series. This difference does not effect use and management of the soils. These soils are coarse-loamy, mixed, mesic Typic Eutrochrepts.

Steinsburg soils are on the landscape with somewhat excessively drained, shallow Klinesville soils; well drained, very deep Lewisberry soils; and deep, well drained Lansdale soils. All these soils have less clay throughout than Steinsburg soils. Klinesville soils have more rock fragments throughout than Steinsburg soils.

Typical pedon of Steinsburg channery sandy loam, 3 to 8 percent slopes, 0.25 mile northwest of Whitehall, Mount Pleasant Township, Adams County; on south side of State Route 2002, about 1,400 feet northwest of Township Route 439; in cropland:

Ap—0 to 10 inches; reddish brown (5YR 4/3) channery sandy loam; weak fine granular structure; friable, slightly sticky, slightly plastic; 15 percent rock fragments; slightly acid; abrupt smooth boundary.

Bw—10 to 15 inches; yellowish red (5YR 5/6) channery sandy loam; weak thick platy structure parting to weak fine subangular blocky; friable, slightly sticky, slightly plastic; very few faint clay bridges between sand grains on faces of peds; 20 percent rock fragments; moderately acid; clear smooth boundary.

BC—15 to 20 inches; yellowish red (5YR 4/6) channery sandy loam; weak thick platy structure; friable, nonsticky, nonplastic; very few faint clay bridges between sand grains on faces of peds; 20 percent rock fragments; strongly acid; gradual wavy boundary.

C—20 to 26 inches; reddish brown (5YR 4/4) channery loamy sand; massive; friable, nonsticky, nonplastic; 30 percent rock fragments; strongly acid; abrupt smooth boundary.

R—26 inches; reddish brown (5YR 4/3) micaceous sandstone.

The solum is 12 to 20 inches thick. Bedrock is at a depth between 20 to 40 inches. Rock fragments range from 0 to 20 percent in the solum and from 15 to 60 percent in the substratum. In unlimed areas reaction ranges from extremely acid to strongly acid throughout.

The Ap horizon has hue of 5YR or 10YR, value of 4 or 5, and chroma 2 to 4. The fine earth fraction is sandy loam.

The Bw horizon has hue of 5YR or 10YR, value of 4 or 5, and chroma 3 to 6. The fine earth fraction is sandy loam or loam.

The BC horizon has hue of 5YR or 10YR, value of 4 to 6, and chroma 3 to 6. The fine earth fraction is sandy loam or loam.

The C horizon has hue of 5YR or 10YR, value of 4 to 6, and chroma 3 to 6. The fine earth fraction is loamy sand, sandy loam, or loam.

Watchung Series

The Watchung series is fine, mixed, mesic Typic Ochraqualfs. It consists of very deep, poorly drained soils on lowlands and in depressions. These soils formed in clayey materials weathered from residuum derived from diabase. Slopes range from 0 to 8 percent.

Watchung soils are on the landscape with well drained Legore and Neshaminy soils and somewhat poorly drained Mount Lucas and Lehigh soils. All these soils are browner or redder throughout than Watchung soils.

Typical pedon of Watchung silt loam, 0 to 3 percent slopes, 3 miles south of Gettysburg in Cumberland Township, Adams County; 60 feet north of Township Route 411, about 1,125 feet east of Township Route 404; in an abandoned pasture:

A—0 to 2 inches; very dark gray (10YR 3/1) silt loam; weak fine granular structure; friable, slightly sticky, slightly plastic; slightly acid; abrupt smooth boundary.

E—2 to 9 inches; dark grayish brown (10YR 4/2) silt loam; common medium prominent brown (7.5YR 4/4) and light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable, slightly sticky, plastic; slightly acid; clear wavy boundary.

Btg1—9 to 18 inches; dark gray (5Y 4/1) silty clay; common medium prominent brown (7.5YR 5/4) mottles; strong medium prismatic structure; firm, sticky, plastic; common distinct clay films on faces of peds and lining pores; slightly acid; gradual irregular boundary.

Btg2—18 to 25 inches; gray (5Y 5/1) clay; many medium faint olive gray (5Y 5/2) and many medium prominent greenish gray (5GY 5/1) mottles; moderate medium prismatic and angular blocky structure; firm, very sticky, plastic; many distinct clay films on faces of peds and in pores; neutral; gradual irregular boundary.

Btg3—25 to 30 inches; gray (5Y 5/1) silty clay loam;

many medium prominent greenish gray (5GY 5/1) mottles; moderate medium prismatic structure; friable, sticky, plastic; common distinct clay films on faces of peds and in pores; neutral; gradual irregular boundary.

Btg4—30 to 40 inches; olive (5Y 5/3) clay loam; common medium distinct olive gray (5Y 4/2) and gray (5Y 5/1) mottles; weak medium prismatic structure; friable, sticky, slightly plastic; few distinct clay films on faces of peds and in pores; neutral; gradual irregular boundary.

C—40 to 60 inches; yellowish brown (10YR 5/4) loam; few fine prominent gray (5Y 5/1) mottles; massive; firm, slightly sticky, nonplastic; 5 percent rock fragments; neutral.

The solum is 24 to 55 inches thick. Depth to bedrock is greater than 60 inches. Rock fragments range from 0 to 15 percent throughout. In unlimed areas reaction ranges from very strongly acid to slightly acid in the surface layer, strongly acid to neutral in the subsoil, and moderately acid to neutral in the substratum.

The A horizon has hue of 10YR to 5Y, value of 3 or 4, and chroma of 1 to 4.

The Ap horizon, where it occurs, has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 4. It has few to many prominent mottles.

The E horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 1 to 4. It has few to many prominent mottles.

The Btg horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 0 to 2. It has few to many prominent mottles. In some pedons it has chroma of 3 below a depth of 30 inches. The fine earth fraction is silty clay or clay, but in some pedons it has subhorizons of clay loam or silty clay loam.

The C horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 0 to 6. It has few to many prominent mottles. The fine earth fraction is loam, clay loam, silt loam, or silty clay loam.

Formation of the Soils

This section describes the five factors of soil formation—parent material, climate, relief, plant and animal life, and time. It also describes the processes of soil formation and relates them to the soils of York County.

Factors of Soil Formation

Soils consist of a mixture of weathered rocks, minerals, organic matter, water, and air. Soils formed through the chemical and physical weathering of geologic materials. The extent of weathering and the characteristics of any soil depend on the nature of the parent rock; climate; relief, or lay of the land; plant and animal life in and on the soil; and length of time these factors have affected development.

In York County, vegetation, climate, and time are factors that vary only slightly. Parent material and relief are responsible for most differences in soil properties.

Parent material determines the texture and mineral content of soils. Relief affects drainage, aeration, runoff, erosion, and exposure to sun and wind. Plant and animal life influence soil characteristics through physical and chemical changes. Climate influences the nature and extent of the weathering processes. Time is required for the processes of soil development. Long periods generally are needed for soil development.

Parent Material

Parent material is the unconsolidated mass from which soils formed. It determines the mineralogical and chemical composition of the soil and, to a large extent, the rate at which soil-forming processes take place. In the early stages of soil formation, the mineralogical, physical, and chemical properties of the soil closely resemble those of the parent material. Klinesville soils, for example, are similar in composition to the acid shale from which they formed. As soils age, processes of soil formation alter rocks and minerals and the resulting soils generally have quite different characteristics. The properties of Hagerstown soils, for example, differ greatly from the original limestone parent material.

Many soils in York County formed in place in residuum overlying the original bedrock. Penn, Klinesville, Readington, Reaville, and Croton soils formed in red Triassic shale. Lansdale soils formed in sandstone and conglomerate. Steinsburg and Lewisberry soils formed in red Triassic conglomerate and sandstone. Baile, Chester, Edgemont, Glenelg, Glenville, Manor, and Mt. Airy soils formed in schist and gneiss. Legore, Mount Lucas, Neshaminy, and Watchung soils formed in diabase. Brecknock and Lehigh soils formed in porcelanite. Catoctin and Highfield soils formed in metarhyolite and schists. Myersville soils formed in metabasalt; Arendtsville soils, in breccia and metabasalt; and Athol soils, in conglomerate. Hagerstown, Clarksburg, Conestoga, Duffield, Penlaw, and Pequea soils formed in limestone. Murrill soils formed in transported sandstone and shale colluvium deposited over limestone. Bermudian, Bowmansville, Chagrin, Codorus, Hatboro, Lindside, and Rowland soils formed on flood plains. Birdsboro, Elk, Lamington, and Raritan soils formed on stream terraces.

Climate

York County has a humid, temperate climate. The average annual temperature is about 53 degrees, and the average annual precipitation is about 40 inches.

The climate is uniform throughout the county. Climate, therefore, has had an important overall influence on the characteristics of the soils. But, it has had little influence on local differences among them. Temperatures are moderate and precipitation is ample; consequently, physical and chemical weathering have been moderately rapid. Soluble materials have been leached from the soils. The less soluble materials have been moved downward in the profile.

Plant and Animal Life

Vegetation, animals, bacteria, and fungi affect soil formation. Vegetation is generally responsible for the amount of nutrients in the soil. Earthworms, cicadas, and other burrowing animals help to keep the soil open and porous. Bacteria and fungi decompose vegetation,

thus releasing nutrients for plant food. The native forests in York County have been a greater influence on soil formation than have any other living organism. Human activities, such as clearing the forests and plowing the land, however, have been a great influence on the surface layer of the soil. Other influential human activities have been adding fertilizers, mixing some soil layers, and moving some soil materials from place to place.

Time

The length of time the factors of soil formation have acted on the weathered mineral material is indicated to some extent by the degree of development in the soil profile. For example, Bermudian and Bowmansville soils formed in alluvium; they are considered young, or recent soils. Their parent material has been in place for less time than other soils in the county. The horizonation in Bermudian and Bowmansville soils is less distinct than that of some older soils on uplands.

Chester, Conestoga, and Hagerstown soils have a well developed profile. The parent material of these soils has been in place long enough for distinct horizons to have developed.

Processes of Soil Formation

As weathering proceeds and plants grow on a young soil, several soil-forming processes help to differentiate the layers, or horizons, in a soil. These processes are gains, losses, transfers, and transformations.

Gains occur as leaves and other organic material are deposited on the surface. Animals, floods, wind, and human activities also bring about gains of organic matter and minerals, including some plant nutrients.

Losses occur as minerals are decomposed and some products of weathering are leached from the soil by percolating water. Losses also include removal of nutrients from the soil when crops, forage, and trees are harvested. Other losses occur when fine particles of soil are removed by erosion and when gases escape from decaying organic matter.

Transfers of material from one part of the soil to another are common in most soils. Organic matter is transferred in suspension or in solution from the upper part to the lower part of the soil profile. Calcium is leached from the surface layer, and some calcium is held for a period of time by a clayey subsoil. Bases and other nutrients absorbed by plant roots rise in stems and are stored in leaves and twigs. When plants die and decay, nutrients are returned to the soil.

Transformations in a soil occur through chemical weathering. For example, iron, aluminum, calcium, and other elements are released from primary and secondary minerals in the soil and are changed into other compounds. In well drained Hagerstown soils, for example, red, brown, and yellow weathered and oxidized iron compounds gradually replace the gray and white parent material. Red, brown, and yellow indicate release of iron or oxidation of ferrous oxides to ferric oxides in the presence of an adequate supply of oxygen.

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Glossary

ABC soil A soil having an A, a B, and a C horizon.

AC soil A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye dissolved in 1N ammonium acetate to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Canyon. A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil material. Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvium. Soil material or rock fragments, or both,

moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Congeliturbate. Soil material disturbed by frost action.

Conglomerate. A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic).—Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated).—Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper

balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. Area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser

depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head out. To form a flower head.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be

limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition,

or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as “saturated hydraulic conductivity,” which is defined in the “Soil Survey Manual.” In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as “permeability.” Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Red beds. Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 3 percent
Gently sloping	3 to 8 percent
Strongly sloping	8 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 35 percent
Very steep	35 percent and higher

Classes for complex slopes are as follows:

Nearly level	0 to 3 percent
Undulating	3 to 8 percent
Rolling	8 to 15 percent
Hilly	15 to 25 percent
Steep	25 to 35 percent
Very steep	35 percent and higher

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered

surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus. Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth’s surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at York, Pennsylvania)

Month	Temperature: Average daily maximum	Temperature: Average daily minimum	Temperature: Average daily	Temperature: 2 years in 10 will have-- Maximum temperature higher than--	Temperature: 2 years in 10 will have-- Minimum temperature lower than--	Temperature: Average number of growing degree days*	Precipitation: Average	Precipitation: 2 years in 10 will have-- Less than--	Precipitation: 2 years in 10 will have-- More than--	Precipitation: Average number of days with 0.10 inch or more	Precipitation: Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	38.6	19.4	29.0	64	-10	17	2.89	1.46	4.14	5	10.1
February----	42.3	21.6	31.9	68	-7	33	2.75	1.44	3.90	6	10.3
March-------	53.7	30.4	42.0	80	9	145	3.14	2.18	4.02	6	4.0
April-------	64.5	38.5	51.5	86	21	352	3.60	2.04	4.99	7	0.4
May---------	75.2	48.6	61.9	91	29	679	3.73	1.87	5.34	7	0.0
June--------	83.2	57.6	70.4	95	38	912	4.26	1.73	6.39	7	0.0
July--------	86.9	62.2	74.5	97	46	1,070	3.63	2.02	5.06	6	0.0
August------	85.2	60.8	73.0	96	43	1,024	3.39	1.93	4.68	6	0.0
September---	78.7	53.6	66.1	94	33	784	3.34	1.41	4.99	5	0.0
October-----	67.8	41.9	54.8	85	22	462	3.04	1.25	4.55	5	0.0
November----	54.9	33.9	44.4	77	15	182	3.43	1.90	4.78	6	1.4
December----	42.9	25.0	34.0	69	1	43	3.22	1.62	4.62	6	5.3
Yearly:											
Average---	64.5	41.1	52.8	---	---	---	---	---	---	---	---
Extreme---	102	-19	---	98	-13	---	---	---	---	---	---
Total-----	---	---	---	---	---	5,703	40.41	34.11	46.23	72	31.6

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at York, Pennsylvania)

Probability	Temperature 24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 14	Apr. 30	May 16
2 years in 10 later than--	Apr. 9	Apr. 26	May 12
5 years in 10 later than--	Apr. 1	Apr. 19	May 5
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 20	Oct. 9	Sept. 27
2 years in 10 earlier than--	Oct. 25	Oct. 14	Oct. 2
5 years in 10 earlier than--	Nov. 4	Oct. 23	Oct. 11

Table 3.--Growing Season

(Recorded in the period 1961-90 at York, Pennsylvania)

Probability	Daily minimum temperature during growing season: Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	194	170	140
8 years in 10	202	175	146
5 years in 10	216	186	158
2 years in 10	230	198	169
1 year in 10	238	203	176

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
ArB	Arendtsville gravelly loam, 3 to 8 percent slopes	121	*
ArC	Arendtsville gravelly loam, 8 to 15 percent slopes	235	*
ArD	Arendtsville gravelly loam, 15 to 25 percent slopes	109	*
AtB	Athol gravelly silt loam, 3 to 8 percent slopes	583	*
AtC	Athol gravelly silt loam, 8 to 15 percent slopes	766	0.1
Ba	Baile silt loam	628	0.1
Be	Bermudian silt loam	443	*
BgA	Birdsboro silt loam, 0 to 3 percent slopes	148	*
BgB	Birdsboro silt loam, 3 to 8 percent slopes	989	0.2
BgC	Birdsboro silt loam, 8 to 15 percent slopes	30	*
Bo	Bowmansville silt loam	2,071	0.4
BrB	Brecknock channery silt loam, 3 to 8 percent slopes	188	*
BrC	Brecknock channery silt loam, 8 to 15 percent slopes	1,136	0.2
BrD	Brecknock channery silt loam, 15 to 25 percent slopes	585	0.1
BsD	Brecknock channery silt loam, 8 to 25 percent slopes, very stony	1,815	0.3
BsF	Brecknock channery silt loam, 25 to 60 percent slopes, very stony	888	0.2
CcC	Catoctin channery silt loam, 8 to 15 percent slopes	73	*
Cd	Chagrin silt loam	1,452	0.2
CeB	Chester silt loam, 3 to 8 percent slopes	72,881	12.5
CeC	Chester silt loam, 8 to 15 percent slopes	29,454	5.1
CkA	Clarksburg silt loam, 0 to 3 percent slopes	2,241	0.4
CkB	Clarksburg silt loam, 3 to 8 percent slopes	883	0.2
Cm	Codorus silt loam	16,004	2.7
CnA	Conestoga silt loam, 0 to 3 percent slopes	238	*
CnB	Conestoga silt loam, 3 to 8 percent slopes	5,108	0.9
CnC	Conestoga silt loam, 8 to 15 percent slopes	1,087	0.2
CrA	Croton silt loam, 0 to 3 percent slopes	5,356	0.9
CrB	Croton silt loam, 3 to 8 percent slopes	699	0.1
DuA	Duffield silt loam, 0 to 3 percent slopes	808	0.1
DuB	Duffield silt loam, 3 to 8 percent slopes	4,027	0.7
DuC	Duffield silt loam, 8 to 15 percent slopes	1,290	0.2
DWD	Duffield and Hagerstown silt loams, 15 to 25 percent slopes	158	*
Dx	Dumps, refuse	419	*
EdB	Edgemont channery loam, 3 to 8 percent slopes	806	0.1
EdC	Edgemont channery loam, 8 to 15 percent slopes	2,226	0.4
EdD	Edgemont channery loam, 15 to 25 percent slopes	900	0.2
EeB	Edgemont channery loam, 0 to 8 percent slopes, very stony	647	0.1
EeD	Edgemont channery loam, 8 to 25 percent slopes, very stony	5,928	1.0
EeF	Edgemont channery loam, 25 to 70 percent slopes, very stony	2,767	0.5
EkA	Elk silt loam, 0 to 3 percent slopes	462	*
EkB	Elk silt loam, 3 to 8 percent slopes	865	0.1
GbB	Glenelg channery silt loam, 3 to 8 percent slopes	17,470	3.0
GbC	Glenelg channery silt loam, 8 to 15 percent slopes	48,407	8.3
GbD	Glenelg channery silt loam, 15 to 25 percent slopes	4,184	0.7
GdA	Glenville silt loam, 0 to 3 percent slopes	6,067	1.0
GdB	Glenville silt loam, 3 to 8 percent slopes	5,453	0.9
HaA	Hagerstown silt loam, 0 to 3 percent slopes	275	*
HaB	Hagerstown silt loam, 3 to 8 percent slopes	1,558	0.3
HaC	Hagerstown silt loam, 8 to 15 percent slopes	395	*
Hc	Hatboro silt loam	1,775	0.3
HgB	Highfield channery silt loam, 3 to 8 percent slopes	366	*
HgC	Highfield channery silt loam, 8 to 15 percent slopes	444	*
HHD	Highfield and Catoctin channery silt loams, 15 to 25 percent slopes	208	*
HKD	Highfield, Catoctin, and Myersville soils, 8 to 25 percent slopes, very stony	491	*
KnD	Klinesville channery silt loam, 15 to 25 percent slopes	5,580	1.0
KnE	Klinesville channery silt loam, 25 to 40 percent slopes	843	0.1
Lc	Lamington silt loam	190	*
LeB	Lansdale loam, 3 to 8 percent slopes	3,403	0.6
LfC	Lansdale channery loam, 8 to 15 percent slopes	2,282	0.4
LgB	Legore channery silt loam, 3 to 8 percent slopes	1,618	0.3

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
LgC	Legore channery silt loam, 8 to 15 percent slopes	1,956	0.3
LgD	Legore channery silt loam, 15 to 25 percent slopes	1,677	0.3
LhA	Lehigh channery silt loam, 0 to 3 percent slopes	196	*
LhB	Lehigh channery silt loam, 3 to 8 percent slopes	7,175	1.2
LhC	Lehigh channery silt loam, 8 to 15 percent slopes	4,931	0.8
LhD	Lehigh channery silt loam, 15 to 25 percent slopes	225	*
LkB	Lehigh channery silt loam, 0 to 8 percent slopes, very stony	130	*
LrB	Lewisberry gravelly sandy loam, 3 to 8 percent slopes	950	0.2
LrC	Lewisberry gravelly sandy loam, 8 to 15 percent slopes	1,438	0.2
LSD	Lewisberry and Lansdale soils, 8 to 25 percent slopes, very stony	1,242	0.2
Lw	Lindside silt loam	2,810	0.5
MdA	Mount Lucas silt loam, 0 to 3 percent slopes	437	*
MdB	Mount Lucas silt loam, 3 to 8 percent slopes	1,757	0.3
MeB	Mount Lucas silt loam, 0 to 8 percent slopes, very bouldery	923	0.2
MOB	Mt. Airy and Manor soils, 3 to 8 percent slopes	9,335	1.6
MOC	Mt. Airy and Manor soils, 8 to 15 percent slopes	43,446	7.5
MOD	Mt. Airy and Manor soils, 15 to 25 percent slopes	48,636	8.3
MOE	Mt. Airy and Manor soils, 25 to 35 percent slopes	10,933	1.9
MPD	Mt. Airy and Manor soils, 8 to 25 percent slopes, very stony	3,189	0.5
MRF	Mt. Airy and Manor soils, 25 to 60 percent slopes, extremely stony	12,487	2.1
MvB	Murrill gravelly loam, 3 to 8 percent slopes	1,604	0.3
MvC	Murrill gravelly loam, 8 to 15 percent slopes	749	0.1
NaB	Neshaminy channery silt loam, 3 to 8 percent slopes	3,276	0.6
NaC	Neshaminy channery silt loam, 8 to 15 percent slopes	1,976	0.3
NdB	Neshaminy channery silt loam, 0 to 8 percent slopes, extremely bouldery	1,147	0.2
NdD	Neshaminy channery silt loam, 8 to 25 percent slopes, extremely bouldery	7,571	1.3
NdE	Neshaminy channery silt loam, 25 to 45 percent slopes, extremely bouldery	2,577	0.4
Pa	Penlaw silt loam	968	0.2
PbB	Penn loam, 0 to 8 percent slopes, very stony	740	0.1
PbD	Penn loam, 8 to 25 percent slopes, very stony	8,886	1.5
PcF	Penn channery loam, 25 to 50 percent slopes, very stony	3,650	0.6
PeB	Penn silt loam, 3 to 8 percent slopes	21,834	3.7
PeC	Penn silt loam, 8 to 15 percent slopes	5,618	1.0
PoB	Penn-Klinesville channery silt loams, 3 to 8 percent slopes	7,941	1.4
PoC	Penn-Klinesville channery silt loams, 8 to 15 percent slopes	18,428	3.2
PpB	Penn-Lansdale complex, 3 to 8 percent slopes	5,388	0.9
PpC	Penn-Lansdale complex, 8 to 15 percent slopes	2,785	0.5
PsB	Pequea silt loam, 3 to 8 percent slopes	166	*
PsC	Pequea silt loam, 8 to 15 percent slopes	554	*
PsD	Pequea silt loam, 15 to 25 percent slopes	412	*
Pt	Pits, quarries	1,864	0.3
RaA	Raritan silt loam, 0 to 3 percent slopes	515	*
RaB	Raritan silt loam, 3 to 8 percent slopes	1,045	0.2
ReA	Readington silt loam, 0 to 3 percent slopes	3,442	0.6
ReB	Readington silt loam, 3 to 8 percent slopes	4,625	0.8
RfB	Reaville channery silt loam, 3 to 8 percent slopes	705	0.1
RfC	Reaville channery silt loam, 8 to 15 percent slopes	79	*
Rw	Rowland silt loam	6,186	1.1
StC	Steinsburg channery sandy loam, 8 to 15 percent slopes	113	*
StD	Steinsburg channery sandy loam, 15 to 25 percent slopes	1,997	0.3
Uc	Urban land	16,704	2.9
UdB	Urban land-Chester complex, 0 to 8 percent slopes	4,013	0.7
UeB	Urban land-Conestoga complex, 0 to 8 percent slopes	3,809	0.7
UfC	Urban land-Mt. Airy complex, 8 to 15 percent slopes	2,385	0.4
UgB	Urban land-Penn complex, 0 to 8 percent slopes	3,728	0.6
WaA	Watchung silt loam, 0 to 3 percent slopes	1,965	0.3
WaB	Watchung silt loam, 3 to 8 percent slopes	267	*
WbB	Watchung silt loam, 0 to 8 percent slopes, extremely bouldery	4,294	0.7
	Water	5,465	0.9
	Total	581,867	100.0

* Less than 0.1 percent.

Table 5.--Prime Farmland

Map symbol	Soil name
ArB	Arendtsville gravelly loam, 3 to 8 percent slopes
AtB	Athol gravelly silt loam, 3 to 8 percent slopes
Be	Bermudian silt loam
BgA	Birdsboro silt loam, 0 to 3 percent slopes
BgB	Birdsboro silt loam, 3 to 8 percent slopes
BrB	Brecknock channery silt loam, 3 to 8 percent slopes
Cd	Chagrin silt loam
CeB	Chester silt loam, 3 to 8 percent slopes
CkA	Clarksburg silt loam, 0 to 3 percent slopes
CkB	Clarksburg silt loam, 3 to 8 percent slopes
Cm	Codorus silt loam
CnA	Conestoga silt loam, 0 to 3 percent slopes
CnB	Conestoga silt loam, 3 to 8 percent slopes
DuA	Duffield silt loam, 0 to 3 percent slopes
DuB	Duffield silt loam, 3 to 8 percent slopes
EdB	Edgemont channery loam, 3 to 8 percent slopes
EkA	Elk silt loam, 0 to 3 percent slopes
EkB	Elk silt loam, 3 to 8 percent slopes
GbB	Glenelg channery silt loam, 3 to 8 percent slopes
GdA	Glenville silt loam, 0 to 3 percent slopes
GdB	Glenville silt loam, 3 to 8 percent slopes
HaA	Hagerstown silt loam, 0 to 3 percent slopes
HaB	Hagerstown silt loam, 3 to 8 percent slopes
HgB	Highfield channery silt loam, 3 to 8 percent slopes
LeB	Lansdale loam, 3 to 8 percent slopes
LgB	Legore channery silt loam, 3 to 8 percent slopes
LhA	Lehigh channery silt loam, 0 to 3 percent slopes
LhB	Lehigh channery silt loam, 3 to 8 percent slopes
LrB	Lewisberry gravelly sandy loam, 3 to 8 percent slopes
Lw	Lindside silt loam
MdA	Mount Lucas silt loam, 0 to 3 percent slopes
MdB	Mount Lucas silt loam, 3 to 8 percent slopes
MOB	Mt. Airy and Manor soils, 3 to 8 percent slopes
MvB	Murrill gravelly loam, 3 to 8 percent slopes
NaB	Neshaminy channery silt loam, 3 to 8 percent slopes
PeB	Penn silt loam, 3 to 8 percent slopes
PpB	Penn-Lansdale complex, 3 to 8 percent slopes
RaA	Raritan silt loam, 0 to 3 percent slopes
RaB	Raritan silt loam, 3 to 8 percent slopes
ReA	Readington silt loam, 0 to 3 percent slopes
Rw	Rowland silt loam

Table 6.--Map Units with Hydric Components

(The columns under "Hydric soils criteria" indicate the conditions that caused the map unit component to be classified as "hydric" or "nonhydric." These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publications No. 1491, June 1991). The "FSA criteria and information" column contains information needed for the Food Security Act determinations required by section 512.11 (h) (4) of the National Food Security Manual (August 1991). Absence of an entry indicates the feature was not rated)

Map symbol and soil name	Component (C) Inclusion (I)	Hydric	Local landform	Hydric soils criteria: Hydric criteria Code	Hydric soils criteria: Meets saturation criteria	Hydric soils criteria: Meets flooding criteria	Hydric soils criteria: Meets ponding criteria	FSA criteria and information: Natural condition of soil
Ba:								
Baile silt loam	Baile (C)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Codorus (I)	No	---	---	---	---	---	---
	Hatboro (I)	Yes	Flood plains	2B3	Yes	No	No	Wooded.
	Glenville (I)	No	---	---	---	---	---	---
	Stony areas (I)	No	---	---	---	---	---	---
Bo:								
Bowmansville silt loam	Bowmansville (C)	Yes	Flood plains	2A	No	Yes	No	Wooded.
	Croton (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Lamington (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Rowland (I)	No	---	---	---	---	---	---
CrA:								
Croton silt loam, 0 to 3 percent slopes	Croton (C)	Yes	Drainageways	2B3	Yes	No	No	Wooded.
	Bowmansville (I)	No	---	---	---	---	---	---
	Rowland (I)	No	---	---	---	---	---	---
	Raritan (I)	No	---	---	---	---	---	---
CrB:								
Croton silt loam, 3 to 8 percent slopes	Croton (C)	Yes	Drainageways	2B3	Yes	No	No	Wooded.
	Readington (I)	No	---	---	---	---	---	---
	Reaville (I)	No	---	---	---	---	---	---
	Stony areas (I)	No	---	---	---	---	---	---
Hc:								
Hatboro silt loam	Hatboro (C)	Yes	Flood plains	2B3	Yes	No	No	Wooded.
	Codorus (I)	No	---	---	---	---	---	---
	Lindside (I)	No	---	---	---	---	---	---
	Glenville (I)	No	---	---	---	---	---	---
	Baile (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Watchung (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
Lc:								
Lamington silt loam	Lamington (C)	Yes	Terraces	2B3	Yes	No	No	Wooded.
	Birdsboro (I)	No	---	---	---	---	---	---
	Raritan (I)	No	---	---	---	---	---	---
	Bowmansville (I)	No	---	---	---	---	---	---
	Rowland (I)	No	---	---	---	---	---	---

Table 6.--Map Units with Hydric Components--Continued

Map symbol and soil name	Component (C) Inclusion (I)	Hydric	Local landform	Hydric soils criteria: Hydric criteria Code	Hydric soils criteria: Meets saturation criteria	Hydric soils criteria: Meets flooding criteria	Hydric soils criteria: Meets ponding criteria	FSA criteria and information: Natural condition of soil
WaA: Watchung silt loam, 0 to 3 percent slopes	Watchung (C)	Yes	Drainageways	2B3	Yes	No	No	Wooded.
	Lehigh (I)	No	---	---	---	---	---	---
	Mount Lucas (I)	No	---	---	---	---	---	---
WaB: Watchung silt loam, 3 to 8 percent slopes	Watchung (C)	Yes	Drainageways	2B3	Yes	No	No	Wooded.
	Lehigh (I)	No	---	---	---	---	---	---
	Mount Lucas (I)	No	---	---	---	---	---	---
WbB: Watchung silt loam, 0 to 8 percent slopes, extremely bouldery	Watchung (C)	Yes	Drainageways	2B3	Yes	No	No	Wooded.
	Lehigh (I)	No	---	---	---	---	---	---
	Mount Lucas (I)	No	---	---	---	---	---	---
	Highfield(I)	No	---	---	---	---	---	---
	Neshaminy(I)	No	---	---	---	---	---	---

Table 7.--Map Units with Hydric Inclusions

(The columns under "Hydric soils criteria" indicate the conditions that caused the map unit component to be classified as "hydric" or "nonhydric." These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publications No. 1491, June 1991). The "FSA criteria and information" column contains information needed for the Food Security Act determinations required by section 512.11 (h) (4) of the National Food Security Manual (August 1991). Absence of an entry indicates the feature was not rated)

Map symbol and soil name	Component (C) Inclusion (I)	Hydric	Local landform	Hydric soils criteria: Hydric criteria Code	Hydric soils criteria: Meets saturation criteria	Hydric soils criteria: Meets flooding criteria	Hydric soils criteria: Meets ponding criteria	FSA criteria and information: Natural condition of soil
BgA: Birdsboro silt loam, 0 to 3 percent slopes	Birdsboro (C)	No	---	---	---	---	---	---
	Bermudian (I)	No	---	---	---	---	---	---
	Lamington (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Raritan (I)	No	---	---	---	---	---	---
BgB: Birdsboro silt loam, 3 to 8 percent slopes	Birdsboro (C)	No	---	---	---	---	---	---
	Bermudian (I)	No	---	---	---	---	---	---
	Lamington (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Raritan (I)	No	---	---	---	---	---	---
BgC: Birdsboro silt loam, 8 to 15 percent slopes	Birdsboro (C)	No	---	---	---	---	---	---
	Bermudian (I)	No	---	---	---	---	---	---
	Lamington (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Raritan (I)	No	---	---	---	---	---	---
	Stony areas (I)	No	---	---	---	---	---	---
Cm: Codorus silt loam	Codorous (C)	No	---	---	---	---	---	---
	Baile (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Chagrin (I)	No	---	---	---	---	---	---
	Glenville (I)	No	---	---	---	---	---	---
	Hatboro (I)	No	---	---	---	---	---	---
GdA: Glenville silt loam, 0 to 3 percent slopes	Glenville (C)	No	---	---	---	---	---	---
	Codorus (I)	No	---	---	---	---	---	---
	Hatboro (I)	Yes	Flood plains	2B3	Yes	No	No	Wooded.
	Elk (I)	No	---	---	---	---	---	---
GdB: Glenville silt loam, 3 to 8 percent slopes	Glenville (C)	No	---	---	---	---	---	---
	Chester (I)	No	---	---	---	---	---	---
	Elk (I)	No	---	---	---	---	---	---
	Glenelg (I)	No	---	---	---	---	---	---
	Baile (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Manor (I)	No	---	---	---	---	---	---

Table 7.--Map Units with Hydric Inclusions--Continued

Map symbol and soil name	Component (C) Inclusion (I)	Hydric	Local landform	Hydric soils criteria: Hydric criteria Code	Hydric soils criteria: Meets saturation criteria	Hydric soils criteria: Meets flooding criteria	Hydric soils criteria: Meets ponding criteria	FSA criteria and information: Natural condition of soil
LhA: Lehigh channery silt loam, 0 to 3 percent slopes	Lehigh (C)	No	---	---	---	---	---	---
	Reaville (I)	No	---	---	---	---	---	---
	Watchung (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
LhB: Lehigh channery silt loam, 3 to 8 percent slopes	Lehigh (C)	No	---	---	---	---	---	---
	Reaville (I)	No	---	---	---	---	---	---
	Watchung (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
LhC: Lehigh channery silt loam, 8 to 15 percent slopes	Lehigh (C)	No	---	---	---	---	---	---
	Brecknock (I)	No	---	---	---	---	---	---
	Watchung (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
LhD: Lehigh channery silt loam, 15 to 25 percent slopes	Lehigh (C)	No	---	---	---	---	---	---
	Brecknock (I)	No	---	---	---	---	---	---
	Klinesville (I)	No	---	---	---	---	---	---
	Watchung (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
LkB: Lehigh channery silt loam, 0 to 8 percent slopes, very stony	Lehigh (C)	No	---	---	---	---	---	---
	Reaville (I)	No	---	---	---	---	---	---
	Watchung (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
Lw: Lindside silt loam	Lindside (C)	No	---	---	---	---	---	---
	Chagrin (I)	No	---	---	---	---	---	---
	Hatboro (I)	Yes	Drainageways	2B3	Yes	No	No	Wooded.
MdA: Mount Lucas silt loam, 0 to 3 percent slopes	Mount Lucas (C)	No	---	---	---	---	---	---
	Neshaminy (I)	No	---	---	---	---	---	---
	Watchung (I)	Yes	Drainageways	2B3	Yes	No	No	Wooded.
MdB: Mount Lucas silt loam, 3 to 8 percent slopes	Mount Lucas (C)	No	---	---	---	---	---	---
	Neshaminy (I)	No	---	---	---	---	---	---
	Watchung (I)	Yes	Drainageways	2B3	Yes	No	No	Wooded.

Table 7.--Map Units with Hydric Inclusions--Continued

Map symbol and soil name	Component (C) Inclusion (I)	Hydric	Local landform	Hydric soils criteria: Hydric criteria Code	Hydric soils criteria: Meets saturation criteria	Hydric soils criteria: Meets flooding criteria	Hydric soils criteria: Meets ponding criteria	FSA criteria and information: Natural condition of soil
MeB: Mount Lucas silt loam, 0 to 8 percent slopes, very bouldery	Mount Lucas (C)	No	---	---	---	---	---	---
	Neshaminy (I)	No	---	---	---	---	---	---
	Watchung (I)	Yes	Drainageways	2B3	Yes	No	No	Wooded.
NaB: Neshaminy channery silt loam, 3 to 8 percent slopes	Neshaminy (C)	No	---	---	---	---	---	---
	Mount Lucas (I)	No	---	---	---	---	---	---
	Watchung (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
NaC: Neshaniny channery silt loam, 8 to 15 percent slopes	Neshaminy (C)	No	---	---	---	---	---	---
	Mount Lucas (I)	No	---	---	---	---	---	---
	Watchung (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
Pa: Penlaw silt loam	Penlaw (C)	No	---	---	---	---	---	---
	Conestoga (I)	No	---	---	---	---	---	---
	Duffield (I)	No	---	---	---	---	---	---
	Elk (I)	No	---	---	---	---	---	---
	Lindside (I)	No	---	---	---	---	---	---
	Poorly drained soils (I)	Yes	Depressions	---	---	---	---	---
RaA: Raritan silt loam, 0 to 3 percent slopes	Raritan (C)	No	---	---	---	---	---	---
	Birdsboro (I)	No	---	---	---	---	---	---
	Croton (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Lamington (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Rowland (I)	No	---	---	---	---	---	---
RaB: Raritan silt loam, 3 to 8 percent slopes	Raritan (C)	No	---	---	---	---	---	---
	Birdsboro (I)	No	---	---	---	---	---	---
	Croton (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Lamington (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Rowland (I)	No	---	---	---	---	---	---
ReA: Readington silt loam, 0 to 3 percent slopes	Readington (C)	No	---	---	---	---	---	---
	Athol (I)	No	---	---	---	---	---	---
	Penn (I)	No	---	---	---	---	---	---
	Croton (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.

Table 7.--Map Units with Hydric Inclusions--Continued

Map symbol and soil name	Component (C) Inclusion (I)	Hydric	Local landform	Hydric soils criteria: Hydric criteria Code	Hydric soils criteria: Meets saturation criteria	Hydric soils criteria: Meets flooding criteria	Hydric soils criteria: Meets ponding criteria	FSA criteria and information: Natural condition of soil
ReB: Readington silt loam, 3 to 8 percent slopes	Readington (C)	No	---	---	---	---	---	---
	Athol (I)	No	---	---	---	---	---	---
	Penn (I)	No	---	---	---	---	---	---
	Croton (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
RfB: Reaville channery silt loam, 3 to 8 percent slopes	Reaville (C)	No	---	---	---	---	---	---
	Klinesville (I)	No	---	---	---	---	---	---
	Croton (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Lehigh (I)	No	---	---	---	---	---	---
	Penn (I)	No	---	---	---	---	---	---
RfC: Reaville channery silt loam, 8 to 15 percent slopes	Reaville (C)	No	---	---	---	---	---	---
	Klinesville (I)	No	---	---	---	---	---	---
	Penn (I)	No	---	---	---	---	---	---
	Croton (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Lehigh (I)	No						
Rw: Rowland silt loam	Rowland (C)	No	---	---	---	---	---	---
	Bowmansville (I)	No	---	---	---	---	---	---
	Lamington (I)	Yes	Drainageways	2B3	Yes	No	No	Wooded.
	Raritan (I)	No	---	---	---	---	---	---

Table 8.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of nonirrigated management by component name. Absence of a yield indicates that the soil or miscellaneous area is not suited to the crop or the crop generally is not grown on the soil or miscellaneous area)

Map symbol and soil name	Land capability	Corn	Corn silage	Alfalfa hay	Soybeans	Pasture	Grass-legume hay	Wheat
		Bu	Tons	Tons	Bu	AUM	Tons	Bu
ArB:								
Arendtsville----	2E	120	24.0	4.5	40	8.5	3.5	45
ArC:								
Arendtsville----	3E	110	22.0	4.0	32	8.0	3.0	40
ArD:								
Arendtsville----	4E	95	19.0	4.0	27	8.0	3.0	35
AtB:								
Athol-----------	2E	135	27.0	5.5	45	10.5	3.5	50
AtC:								
Athol-----------	3E	125	25.0	5.0	42	9.5	3.5	45
Ba:								
Baile-----------	5W	---	---	---	25	4.0	2.0	---
Be:								
Bermudian-------	1	140	28.0	5.5	55	10.5	3.5	50
BgA:								
Birdsboro-------	1	140	28.0	5.0	55	9.5	3.5	50
BgB:								
Birdsboro-------	2E	140	28.0	5.0	55	9.5	3.5	50
BgC:								
Birdsboro-------	3E	130	26.0	4.5	42	8.5	3.5	45
Bo:								
Bowmansville----	3W	115	23.0	---	25	6.5	3.5	35
BrB:								
Brecknock-------	2E	95	19.0	3.5	32	7.0	3.0	40
BrC:								
Brecknock-------	3E	90	18.0	3.0	30	6.0	2.5	35
BrD:								
Brecknock-------	4E	80	16.0	3.0	26	6.0	2.0	30
BsD:								
Brecknock-------	6S	---	---	---	---	---	---	---
BsF:								
Brecknock-------	7S	---	---	---	---	---	---	---
CcC:								
Catoctin--------	3E	75	15.0	3.0	25	6.0	2.5	35

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Corn silage	Alfalfa hay	Soybeans	Pasture	Grass-legume hay	Wheat
		Bu	Tons	Tons	Bu	AUM	Tons	Bu
Cd:								
Chagrin---------	2W	125	25.0	5.0	50	7.0	---	45
CeB:								
Chester---------	2E	135	27.0	5.5	45	8.0	3.5	50
CeC:								
Chester---------	3E	125	25.0	5.0	42	8.0	3.5	45
CkA:								
Clarksburg------	2W	100	20.0	3.5	30	6.5	3.0	40
CkB:								
Clarksburg------	2E	100	20.0	3.5	40	6.5	3.0	40
Cm:								
Codorus---------	2W	130	26.0	4.5	43	8.1	3.5	45
CnA:								
Conestoga-------	1	135	27.0	5.5	45	10.5	3.5	50
CnB:								
Conestoga-------	2E	135	27.0	5.5	55	10.5	3.5	50
CnC:								
Conestoga-------	3E	125	25.0	4.5	40	9.5	3.5	45
CrA:								
Croton----------	4W	70	14.0	---	23	4.9	2.5	27
CrB:								
Croton----------	4W	70	---	---	28	4.9	2.5	---
DuA:								
Duffield--------	1	130	26.0	5.0	55	9.5	3.5	50
DuB:								
Duffield--------	2E	130	26.0	5.0	55	9.5	3.5	50
DuC:								
Duffield--------	3E	125	25.0	4.5	50	8.5	3.0	45
DWD:								
Duffield--------	4E	110	22.0	4.5	45	8.5	3.0	40
Hagerstown------	4E	110	22.0	4.0	40	9.0	3.0	35
Dx*:								
Dumps, refuse.								
EdB:								
Edgemont--------	2E	120	---	4.5	45	8.5	3.5	45
EdC:								
Edgemont--------	3E	110	---	4.0	40	8.0	3.0	40

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Corn silage	Alfalfa hay	Soybeans	Pasture	Grass-legume hay	Wheat
		Bu	Tons	Tons	Bu	AUM	Tons	Bu
EdD:								
Edgemont--------	4E	95	19.0	4.0	35	8.0	3.0	35
EeB:								
Edgemont--------	6S	---	---	---	---	---	---	---
EeD:								
Edgemont--------	6S	---	---	---	---	---	---	---
EeF:								
Edgemont--------	7S	---	---	---	---	---	---	---
EkA:								
Elk-------------	1	130	26.0	5.0	55	9.0	4.5	45
EkB:								
Elk-------------	2E	125	25.0	5.0	50	9.0	4.5	45
GbB:								
Glenelg---------	2E	135	27.0	5.5	55	10.5	3.5	50
GbC:								
Glenelg---------	3E	125	25.0	5.0	50	9.5	3.5	45
GbD:								
Glenelg---------	4E	110	22.0	4.5	44	8.5	3.0	40
GdA:								
Glenville-------	2W	100	20.0	3.5	40	6.5	3.0	40
GdB:								
Glenville-------	2E	100	20.0	3.5	40	6.5	3.0	40
HaA:								
Hagerstown------	1	135	27.0	5.5	55	10.5	3.5	50
HaB:								
Hagerstown------	2E	135	27.0	5.5	55	10.5	3.5	50
HaC:								
Hagerstown------	3E	125	25.0	5.0	50	9.5	3.5	45
Hc:								
Hatboro---------	3W	115	23.0	---	45	6.6	3.5	---
HgB:								
Highfield-------	2E	115	23.0	4.5	47	8.5	3.5	45
HgC:								
Highfield-------	3E	110	22.0	4.0	45	7.5	3.0	40
HHD:								
Highfield-------	4E	100	20.0	4.0	35	7.5	3.0	35
Catoctin--------	4E	70	14.0	3.0	35	5.5	2.0	30

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Corn silage	Alfalfa hay	Soybeans	Pasture	Grass-legume hay	Wheat
		Bu	Tons	Tons	Bu	AUM	Tons	Bu
HKD:								
Highfield-------	6S	---	---	---	---	---	---	---
Catoctin--------	7S	---	---	---	---	---	---	---
Myersville------	6S	---	---	---	---	---	---	---
KnD:								
Klinesville-----	6E	45	10.0	2.0	20	4.5	1.5	15
KnE:								
Klinesville-----	7E	---	---	---	---	---	---	---
Lc:								
Lamington-------	4W	65	13.0	---	25	4.0	2.5	---
LeB:								
Lansdale--------	2E	120	22.0	4.5	50	8.5	3.0	45
LfC:								
Lansdale--------	3E	120	22.0	4.5	50	8.5	3.0	45
LgB:								
Legore----------	2E	95	19.0	3.5	40	6.5	3.0	40
LgC:								
Legore----------	3E	95	19.0	3.5	40	6.5	3.0	40
LgD:								
Legore----------	4E	80	16.0	3.0	30	5.5	2.0	30
LhA:								
Lehigh----------	2W	95	19.0	---	40	5.5	3.0	---
LhB:								
Lehigh----------	2W	95	19.0	---	40	5.5	3.0	---
LhC:								
Lehigh----------	3E	90	18.0	---	40	5.5	3.0	---
LhD:								
Lehigh----------	4E	80	16.0	---	30	5.5	3.0	---
LkB:								
Lehigh----------	7S	---	---	---	---	---	---	---
LrB:								
Lewisberry------	2S	90	18.0	4.0	40	7.5	3.0	45
LrC:								
Lewisberry------	3E	80	16.0	3.5	35	7.0	3.0	40
LSD:								
Lewisberry------	6S	---	---	---	---	---	---	---
Lansdale--------	6S	---	---	---	---	---	---	---

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Corn silage	Alfalfa hay	Soybeans	Pasture	Grass-legume hay	Wheat
		Bu	Tons	Tons	Bu	AUM	Tons	Bu
Lw:								
Lindside--------	2W	120	---	4.5	45	---	3.5	40
MdA:								
Mount Lucas-----	2W	105	21.0	4.0	40	7.5	3.0	45
MdB:								
Mount Lucas-----	2E	105	21.0	4.0	40	7.5	3.0	45
MeB:								
Mount Lucas-----	6S	---	---	---	---	---	---	---
MOB:								
Mt. Airy--------	3E	85	17.0	3.5	45	6.5	3.0	35
Manor-----------	2E	115	23.0	3.5	40	6.5	3.0	40
MOC:								
Mt. Airy--------	4E	75	15.0	3.0	35	6.0	2.5	30
Manor-----------	3E	105	21.0	3.0	30	6.0	2.5	35
MOD:								
Mt. Airy--------	6E	---	---	2.5	25	5.5	2.0	---
Manor-----------	4E	95	19.0	3.0	25	5.5	2.0	30
MOE:								
Mt. Airy--------	7E	---	---	---	---	---	---	---
Manor-----------	6E	---	---	---	---	---	---	---
MPD:								
Mt. Airy--------	6S	---	---	---	---	3.0	---	---
Manor-----------	6S	---	---	---	---	---	---	---
MRF:								
Mt. Airy--------	7S	---	---	---	---	---	---	---
Manor-----------	7S	---	---	---	---	---	---	---
MvB:								
Murrill---------	2E	120	24.0	4.5	45	8.5	3.5	45
MvC:								
Murrill---------	3E	110	22.0	4.0	40	7.5	3.0	40
NaB:								
Neshaminy-------	2E	135	26.0	5.5	50	10.5	3.5	50
NaC:								
Neshaminy-------	3E	125	25.0	5.0	45	9.5	3.5	45
NdB:								
Neshaminy-------	7S	---	---	---	---	---	---	---

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Corn silage	Alfalfa hay	Soybeans	Pasture	Grass-legume hay	Wheat
		Bu	Tons	Tons	Bu	AUM	Tons	Bu
NdD:								
Neshaminy-------	7S	---	---	---	---	---	---	---
NdE:								
Neshaminy-------	7S	---	---	---	---	---	---	---
Pa:								
Penlaw----------	3W	95	19.0	3.0	35	6.0	3.0	40
PbB:								
Penn------------	6S	---	---	---	---	---	---	---
PbD:								
Penn------------	6S	---	---	---	---	---	---	---
PcF:								
Penn------------	7S	---	---	---	---	---	---	---
PeB:								
Penn------------	2E	95	19.0	3.5	36	6.5	3.0	40
PeC:								
Penn------------	3E	90	18.0	3.0	35	5.5	2.5	35
PoB:								
Penn------------	2E	95	19.0	3.5	35	6.5	3.0	40
Klinesville-----	3E	60	12.0	2.5	25	5.0	2.0	25
PoC:								
Penn------------	3E	90	18.0	3.0	35	5.5	2.5	35
Klinesville-----	4E	55	11.0	2.5	20	5.0	2.0	20
PpB:								
Penn------------	2E	95	19.0	3.5	35	6.5	3.0	40
Lansdale--------	2E	115	21.5	4.5	45	8.5	3.5	45
PpC:								
Penn------------	3E	90	18.0	3.0	35	5.5	2.5	35
Lansdale--------	3E	110	21.0	4.0	40	8.0	3.0	40
PsB:								
Pequea----------	2E	100	20.0	4.0	40	7.5	3.0	40
PsC:								
Pequea----------	3E	90	18.0	3.5	35	6.5	3.0	35
PsD:								
Pequea----------	4E	80	16.0	3.0	32	5.5	2.5	35
Pt*:								
Pits, quarries.								
RaA:								
Raritan---------	2W	105	20.0	4.0	40	8.0	3.0	40

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Corn silage	Alfalfa hay	Soybeans	Pasture	Grass-legume hay	Wheat
		Bu	Tons	Tons	Bu	AUM	Tons	Bu
RaB: Raritan	2E	105	21.0	4.0	40	8.0	3.0	40
ReA: Readington	2W	105	21.0	3.5	40	6.5	3.0	45
ReB: Readington	2E	105	21.0	3.5	40	6.5	3.0	45
RfB: Reaville	3W	75	15.0	---	30	5.0	2.5	---
RfC: Reaville	3E	70	14.0	---	25	4.0	2.0	---
Rw: Rowland	2W	130	26.0	4.5	50	8.5	3.5	45
StC: Steinsburg	3E	75	15.0	3.0	30	6.0	2.5	35
StD: Steinsburg	4E	70	14.0	3.0	28	5.0	2.0	30
Uc*: Urban land	8S	---	---	---	---	---	---	---
UdB*: Urban land	8S	---	---	---	---	---	---	---
Chester	2E	135	27.0	5.5	45	5.5	3.5	50
UeB*: Urban land	8S	---	---	---	---	---	---	---
Conestoga	2E	135	27.0	5.0	45	10.5	3.5	50
UfC*: Urban land	8S	---	---	---	---	---	---	---
Mt. Airy	4E	75	15.0	3.0	---	6.0	2.5	30
UgB*: Urban land	8S	---	---	---	---	---	---	---
Penn	2E	95	19.0	3.5	---	6.5	3.0	40
WaA: Watchung	4W	---	---	---	---	4.0	2.0	---
WaB: Watchung	6W	---	---	---	---	4.0	2.0	---
WbB: Watchung	7S	---	---	---	---	---	---	---

* See the description of the map unit for the composition ad behavoir characteristics of the map unit.

Table 9.--Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that data were not available)

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Trees to plant
ArB:										
Arendtsville	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	71	57	European larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Tuliptree	75	57	
ArC:										
Arendtsville	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	71	57	European larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Tuliptree	75	57	
ArD:										
Arendtsville	4R	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak	71	57	European larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							tuliptree	75	57	
AtB:										
Athol	4A	Slight	Slight	Slight	Slight	Severe	Virginia pine	80	114	European larch, Norway spruce, black walnut, eastern white pine, tuliptree.
							Northern red oak	80	57	
							Shortleaf pine	80	129	
							Tuliptree	90	86	
AtC:										
Athol	4A	Slight	Slight	Slight	Slight	Severe	Virginia pine	80	114	European larch, Norway spruce, black walnut, eastern white pine, tuliptree.
							Northern red oak	80	57	
							Shortleaf pine	80	129	
							Tuliptree	90	86	
Ba:										
Baile	4W	Slight	Moderate	Moderate	Slight	Severe	American holly	---	---	Norway spruce, eastern white pine, white spruce.
							Pin oak	85	57	
							Red maple	---	---	
Be:										
Bermudian	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	85	57	European larch, Norway spruce, black walnut, eastern white pine, tuliptree.
							Sweetgum	95	114	
							Tuliptree	95	100	
BgA:										
Birdsboro	4A	Slight	Slight	Slight	Slight	Severe	Virginia pine	80	114	Japanese larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Northern red oak	80	57	
							Shortleaf pine	80	129	
							Tuliptree	90	86	

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordi-nation symbol	Management concerns: Erosion hazard	Equip-ment limita-tion	Seedling mortal-ity	Wind-throw hazard	Plant competi-tion	Potential productivity: Common trees	Site index	Volume of wood fiber*	Trees to plant
BgB:										
Birdsboro	4A	Slight	Slight	Slight	Slight	Severe	Virginia pine	80	114	Japanese larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Northern red oak	80	57	
							Shortleaf pine	80	129	
							Tuliptree	90	86	
BgC:										
Birdsboro	4A	Slight	Slight	Slight	Slight	Severe	Virginia pine	80	114	Japanese larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Northern red oak	80	57	
							Shortleaf pine	80	129	
							Tuliptree	90	86	
Bo:										
Bowmansville	5W	Slight	Severe	Severe	Moderate	Severe	Pin oak	85	72	Eastern white pine, white spruce.
BrB:										
Brecknock	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	65	100	Virginia pine, eastern white pine.
							Northern red oak	68	57	
							Shortleaf pine	---	---	
BrC:										
Brecknock	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	65	100	Virginia pine, eastern white pine.
							Northern red oak	68	57	
							Shortleaf pine	---	---	
BrD:										
Brecknock	4R	Slight	Moderate	Slight	Slight	Moderate	Virginia pine	65	100	Virginia pine, eastern white pine.
							Northern red oak	68	57	
							Shortleaf pine	---	---	
BsD:										
Brecknock	4R	Slight	Moderate	Slight	Slight	Moderate	Virginia pine	65	100	Virginia pine, eastern white pine.
							Northern red oak	68	57	
							Shortleaf pine	---	---	
BsF:										
Brecknock	4R	Slight	Moderate	Slight	Slight	Moderate	Virginia pine	65	100	Virginia pine, eastern white pine.
							Northern red oak	68	57	
							Shortleaf pine	---	---	
CcC:										
Catoctin	3F	Slight	Slight	Moderate	Moderate	Slight	Virginia pine	60	86	Eastern white pine, shortleaf pine.
							Northern red oak	60	43	
							Shortleaf pine	60	86	
							Tuliptree	70	57	
Cd:										
Chagrin	5A	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak.
							Black walnut	---	---	
							Northern red oak	86	72	
							Sugar maple	86	57	
							Tuliptree	96	100	
							White ash	---	---	
							White oak	---	---	

See footnotes at end of table

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber*	Trees to plant
CeB:										
Chester	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	80	114	Black walnut, eastern white pine, tuliptree.
							Southern red oak	80	57	
							Tuliptree	83	72	
CeC:										
Chester	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	80	114	Black walnut, eastern white pine, tuliptree.
							Southern red oak	80	57	
							Tuliptree	83	72	
CkA:										
Clarksburg	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	75	57	Japanese larch, Norway spruce, eastern white pine, tuliptree.
							Tuliptree	85	86	
CkB:										
Clarksburg	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	75	57	Japanese larch, Norway spruce, eastern white pine, tuliptree.
							Tuliptree	85	86	
Cm:										
Codorus	5W	Slight	Moderate	Slight	Slight	Severe	Black walnut	100	---	European larch, Norway spruce, black walnut, eastern white pine, sugar maple, tuliptree, white ash.
							Eastern white pine	100	143	
							Northern red oak	90	72	
							Sugar maple	90	57	
							Tuliptree	100	114	
							White ash	90	72	
CnA:										
Conestoga	5A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	80	57	Japanese larch, Virginia pine, black walnut, eastern white pine, tuliptree.
							Sugar maple	---	---	
							Tuliptree	90	86	
CnB:										
Conestoga	5A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	85	72	Japanese larch, black walnut, eastern white pine, tuliptree.
							Tuliptree	95	100	
CnC:										
Conestoga	5A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	85	72	Japanese larch, black walnut, eastern white pine, tuliptree.
							Tuliptree	95	100	
CrA:										
Croton	3W	Slight	Severe	Severe	Slight	Severe	Pin oak	65	43	Eastern white pine, pin oak.
							Red maple	---	---	
							Swamp white oak	---	---	
							White ash	---	---	

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Trees to plant
CrB:										
Croton	3W	Slight	Severe	Severe	Slight	Severe	Pin oak	65	43	Eastern white pine, pin oak.
							Red maple	---	---	
							Swamp white oak	---	---	
							White ash	---	---	
DuA:										
Duffield	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak	85	72	Japanese larch, Norway spruce, black walnut, eastern white pine, tuliptree.
							Tuliptree	95	100	
DuB:										
Duffield	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak	85	72	Japanese larch, Norway spruce, black walnut, eastern white pine, tuliptree.
							Tuliptree	95	100	
DuC:										
Duffield	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak	85	72	Japanese larch, Norway spruce, black walnut, eastern white pine, tuliptree.
							Tuliptree	95	100	
DWD:										
Duffield	5R	Moderate	Moderate	Slight	Slight	Severe	Northern red oak	85	72	Japanese larch, Norway spruce, black walnut, eastern white pine, tuliptree.
							Tuliptree	95	100	
Hagerstown	5C	Moderate	Severe	Slight	Slight	Severe	Northern red oak	85	72	Norway spruce, black walnut, eastern white pine, tuliptree.
							Tuliptree	95	100	
Dx**: Dumps, refuse.										
EdB:										
Edgemont	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	69	57	Japanese larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Tuliptree	80	72	
EdC:										
Edgemont	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	69	57	Japanese larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Tuliptree	80	72	

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordi-nation symbol	Management concerns: Erosion hazard	Equip-ment limita-tion	Seedling mortal-ity	Wind-throw hazard	Plant competi-tion	Potential productivity: Common trees	Site index	Volume of wood fiber*	Trees to plant
EdD:										
Edgemont----------	4R	Slight	Moderate	Slight	Slight	Moderate	Northern red oak----	75	57	Japanese larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Tuliptree----------	90	86	
EeB:										
Edgemont----------	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak----	69	57	Japanese larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Tuliptree----------	80	72	
EeD:										
Edgemont----------	4R	Slight	Moderate	Slight	Slight	Moderate	Northern red oak----	75	57	Japanese larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Tuliptree----------	90	86	
EeF:										
Edgemont----------	4R	Moderate	Severe	Slight	Slight	Moderate	Northern red oak----	75	57	Japanese larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Tuliptree----------	90	86	
EkA:										
Elk---------------	7A	Slight	Slight	Slight	Slight	Severe	American sycamore---	---	---	Black walnut, cherrybark oak, eastern white pine, loblolly pine, northern red oak, shortleaf pine, tuliptree, white ash, white oak.
							Black walnut--------	---	---	
							Cherrybark oak------	95	129	
							Common hackberry----	---	---	
							Pin oak-------------	96	86	
							Red maple-----------	---	---	
							Sweetgum------------	98	129	
							Tuliptree-----------	94	100	
EkB:										
Elk---------------	7A	Slight	Slight	Slight	Slight	Severe	American sycamore---	---	---	Black walnut, cherrybark oak, eastern white pine, loblolly pine, northern red oak, shortleaf pine, tuliptree, white ash, white oak.
							Black walnut--------	---	---	
							Cherrybark oak------	95	129	
							Common hackberry----	---	---	
							Pin oak-------------	96	86	
							Red maple-----------	---	---	
							Sweetgum------------	98	129	
							Tuliptree-----------	94	100	
GbB:										
Glenelg-----------	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine-------	70	114	Japanese larch, Virginia pine, black walnut, eastern white pine, shortleaf pine, tuliptree.
							Black oak-----------	78	57	
							Hickory-------------	75	---	
							Red maple-----------	---	---	
							Shortleaf pine------	70	114	
							Tuliptree-----------	87	86	
							White oak-----------	75	57	

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber*	Trees to plant
GbC:										
Glenelg	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	70	114	Japanese larch, Virginia pine, black walnut, eastern white pine, shortleaf pine, tuliptree.
							Black oak	78	57	
							Hickory	75	---	
							Red maple	---	---	
							Shortleaf pine	70	114	
							Tuliptree	87	86	
							White oak	75	57	
GbD:										
Glenelg	4R	Moderate	Moderate	Slight	Slight	Moderate	Virginia pine	70	114	Japanese larch, Virginia pine, black walnut, eastern white pine, shortleaf pine, tuliptree.
							Black oak	78	57	
							Hickory	75	---	
							Red maple	---	---	
							Shortleaf pine	70	114	
							Tuliptree	87	86	
							White oak	75	57	
GdA:										
Glenville	4W	Slight	Moderate	Moderate	Moderate	Severe	Northern red oak	80	57	Japanese larch, Norway spruce, eastern white pine, tuliptree.
							Sugar maple	80	57	
							Tuliptree	90	86	
							White ash	80	57	
GdB:										
Glenville	4W	Slight	Moderate	Moderate	Moderate	Severe	Northern red oak	80	57	Japanese larch, Norway spruce, eastern white pine, tuliptree.
							Sugar maple	80	57	
							Tuliptree	90	86	
							White ash	80	57	
HaA:										
Hagerstown	5C	Slight	Moderate	Slight	Slight	Severe	Northern red oak	85	72	Norway spruce, black walnut, eastern white pine, tuliptree.
							Tuliptree	95	100	
HaB:										
Hagerstown	5C	Slight	Moderate	Slight	Slight	Severe	Northern red oak	85	72	Norway spruce, black walnut, eastern white pine, tuliptree.
							Tuliptree	95	100	
HaC:										
Hagerstown	5C	Slight	Moderate	Slight	Slight	Severe	Northern red oak	85	72	Norway spruce, black walnut, eastern white pine, tuliptree.
							Tuliptree	95	100	
Hc:										
Hatboro	3W	Slight	Severe	Slight	Moderate	Slight	American sycamore	60	43	Eastern white pine, white spruce.
							Pin oak	60	43	
							Red maple	60	43	
HgB:										
Highfield	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	73	57	Japanese larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Tuliptree	80	72	

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordi- nation symbol	Management concerns: Erosion hazard	Equip- ment limita- tion	Seedling mortal- ity	Wind- throw hazard	Plant competi- tion	Potential productivity: Common trees	Site index	Volume of wood fiber*	Trees to plant
HgC:										
Highfield	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	73	57	Japanese larch,
							Tuliptree	80	72	Norway spruce,
										Virginia pine,
										eastern white
										pine, tuliptree.
HHD:										
Highfield	4R	Slight	Moderate	Slight	Slight	Moderate	Northern red oak	73	57	Japanese larch,
							Tuliptree	80	72	Norway spruce,
										Virginia pine,
										eastern white
										pine, tuliptree.
Catoctin	3F	Moderate	Moderate	Moderate	Moderate	Slight	Virginia pine	60	86	Eastern white pine,
							Northern red oak	60	43	shortleaf pine.
							Shortleaf pine	60	86	
							Tuliptree	70	57	
HKD:										
Highfield	4R	Slight	Moderate	Slight	Slight	Moderate	Northern red oak	73	57	Japanese larch,
							Tuliptree	80	72	Norway spruce,
										Virginia pine,
										eastern white
										pine, tuliptree.
Catoctin	6X	Moderate	Moderate	Moderate	Moderate	Slight	Virginia pine	60	86	Eastern white pine,
							Northern red oak	60	43	shortleaf pine.
							Shortleaf pine	60	86	
							Tuliptree	70	57	
Myersville	5X	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak	85	72	Black walnut,
							Tuliptree	95	100	eastern white pine.
KnD:										
Klinesville	3D	Slight	Moderate	Moderate	Slight	Moderate	Virginia pine	60	86	Virginia pine,
							Northern red oak	60	43	eastern white
										pine, pitch pine,
										red pine.
KnE:										
Klinesville	3D	Slight	Moderate	Moderate	Slight	Moderate	Virginia pine	60	86	Virginia pine,
							Northern red oak	60	43	eastern white
										pine, pitch pine,
										red pine.
Lc:										
Lamington	4W	Slight	Severe	Severe	Moderate	Severe	Pin oak	85	57	Eastern white pine,
										white spruce.
LeB:										
Lansdale	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	70	114	Norway spruce,
							Northern red oak	70	57	Virginia pine,
							Shortleaf pine	70	114	eastern white
							Tuliptree	75	57	pine, shortleaf
										pine, tuliptree.

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber*	Trees to plant
LfC:										
Lansdale	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	70	114	Norway spruce, Virginia pine, eastern white pine, shortleaf pine, tuliptree.
							Northern red oak	70	57	
							Shortleaf pine	70	114	
							Tuliptree	75	57	
LgB:										
Legore	4A	Slight	Slight	Slight	Slight	Severe	Virginia pine	75	114	Virginia pine, eastern white pine, loblolly pine, tuliptree.
							Black oak	75	57	
							Shortleaf pine	75	114	
							Tuliptree	85	86	
LgC:										
Legore	4A	Slight	Slight	Slight	Slight	Severe	Virginia pine	75	114	Virginia pine, eastern white pine, loblolly pine, tuliptree.
							Black oak	75	57	
							Shortleaf pine	75	114	
							Tuliptree	85	86	
LgD:										
Legore	4R	Moderate	Moderate	Slight	Slight	Severe	Virginia pine	75	114	Virginia pine, eastern white pine, loblolly pine, tuliptree.
							Black oak	75	57	
							Shortleaf pine	75	114	
							Tuliptree	85	86	
LhA:										
Lehigh	4W	Slight	Moderate	Moderate	Moderate	Moderate	Northern red oak	70	57	Japanese larch, Norway spruce, eastern white pine, tuliptree, white spruce.
							Red maple	70	43	
							Sugar maple	70	43	
							Tuliptree	80	72	
							White ash	70	43	
LhB:										
Lehigh	4W	Slight	Moderate	Moderate	Moderate	Moderate	Northern red oak	70	57	Japanese larch, Norway spruce, eastern white pine, tuliptree, white spruce.
							Red maple	70	43	
							Sugar maple	70	43	
							Tuliptree	80	72	
							White ash	70	43	
LhC:										
Lehigh	4W	Slight	Moderate	Moderate	Moderate	Moderate	Northern red oak	70	57	Japanese larch, Norway spruce, eastern white pine, tuliptree, white spruce.
							Red maple	70	43	
							Sugar maple	70	43	
							Tuliptree	80	72	
							White ash	70	43	
LhD:										
Lehigh	4W	Slight	Moderate	Moderate	Moderate	Moderate	Northern red oak	70	57	Japanese larch, Norway spruce, eastern white pine, tuliptree, white spruce.
							Red maple	70	43	
							Sugar maple	70	43	
							Tuliptree	80	72	
							White ash	70	43	
LkB:										
Lehigh	4W	Slight	Moderate	Moderate	Moderate	Moderate	Northern red oak	70	57	European larch, Norway spruce, eastern white pine, tuliptree, white spruce.
							Red maple	70	43	
							Sugar maple	70	43	
							Tuliptree	80	72	
							White ash	70	43	

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordi-nation symbol	Management concerns: Erosion hazard	Equip-ment limita-tion	Seedling mortal-ity	Wind-throw hazard	Plant competi-tion	Potential productivity: Common trees	Site index	Volume of wood fiber*	Trees to plant
LrB:										
Lewisberry	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	70	114	Japanese larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Northern red oak	69	57	
							Shortleaf pine	70	114	
							Tuliptree	90	86	
LrC:										
Lewisberry	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	70	114	Japanese larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Northern red oak	69	57	
							Shortleaf pine	70	114	
							Tuliptree	90	86	
LSD:										
Lewisberry	4R	Slight	Moderate	Slight	Slight	Moderate	Virginia pine	70	114	Japanese larch, Norway spruce, Virginia pine, eastern white pine, tuliptree.
							Northern red oak	69	57	
							Shortleaf pine	70	114	
							Tuliptree	90	86	
Lansdale	4X	Moderate	Moderate	Slight	Slight	Moderate	Virginia pine	45	57	Virginia pine, eastern white pine, shortleaf pine.
							Northern red oak	70	57	
							Tuliptree	75	57	
Lw:										
Lindside	5A	Slight	Slight	Slight	Slight	Severe	Black walnut	---	---	Japanese larch, Norway spruce, black oak, black walnut, eastern white pine, northern red oak, shortleaf pine, tuliptree, white ash, white oak.
							Northern red oak	86	72	
							Red maple	---	---	
							Tuliptree	95	100	
							White ash	85	57	
							White oak	85	72	
MdA:										
Mount Lucas	4W	Slight	Moderate	Slight	Slight	Severe	Virginia pine	75	114	Virginia pine, eastern white pine, tuliptree.
							Northern red oak	80	57	
							Tuliptree	90	86	
MdB:										
Mount Lucas	4W	Slight	Moderate	Slight	Slight	Severe	Virginia pine	75	114	Virginia pine, eastern white pine, tuliptree.
							Northern red oak	80	57	
							Tuliptree	90	86	
MeB:										
Mount Lucas	4W	Slight	Moderate	Slight	Slight	Slight	Virginia pine	75	114	Virginia pine, eastern white pine, tuliptree.
							Northern red oak	80	57	
							Tuliptree	90	86	

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber*	Trees to plant
MOB:										
Mt. Airy----------	3F	Slight	Slight	Moderate	Slight	Slight	Virginia pine-------	65	100	Virginia pine, eastern white pine.
							Black oak-----------	65	43	
							Chestnut oak--------	---	---	
							Hickory-------------	---	---	
							Red maple-----------	---	---	
							Tuliptree-----------	70	57	
Manor-------------	4A	Slight	Slight	Moderate	Slight	Slight	Virginia pine-------	80	114	Virginia pine, eastern white pine, shortleaf pine, tuliptree.
							Black oak-----------	80	57	
							Blackgum------------	---	---	
							Chestnut oak--------	---	---	
							Hickory-------------	---	---	
							Shortleaf pine------	80	129	
							Southern red oak----	---	---	
							Tuliptree-----------	90	86	
							White oak-----------	---	---	
MOC:										
Mt. Airy----------	3F	Slight	Slight	Moderate	Slight	Slight	Virginia pine-------	65	100	Virginia pine, eastern white pine.
							Black oak-----------	65	43	
							Chestnut oak--------	---	---	
							Hickory-------------	---	---	
							Red maple-----------	---	---	
							Tuliptree-----------	70	57	
Manor-------------	4A	Slight	Slight	Moderate	Slight	Slight	Virginia pine-------	80	114	Virginia pine, eastern white pine, shortleaf pine, tuliptree.
							Black oak-----------	80	57	
							Blackgum------------	---	---	
							Chestnut oak--------	---	---	
							Hickory-------------	---	---	
							Shortleaf pine------	80	129	
							Southern red oak----	---	---	
							Tuliptree-----------	90	86	
							White oak-----------	---	---	
MOD:										
Mt. Airy----------	3F	Moderate	Moderate	Moderate	Slight	Slight	Virginia pine-------	65	100	Virginia pine, eastern white pine.
							Black oak-----------	65	43	
							Chestnut oak--------	---	---	
							Hickory-------------	---	---	
							Red maple-----------	---	---	
							Tuliptree-----------	70	57	
Manor-------------	4R	Moderate	Moderate	Moderate	Slight	Slight	Virginia pine-------	80	114	Virginia pine, eastern white pine, shortleaf pine, tuliptree.
							Black oak-----------	80	57	
							Blackgum------------	---	---	
							Chestnut oak--------	---	---	
							Hickory-------------	---	---	
							Shortleaf pine------	80	129	
							Southern red oak----	---	---	
							Tuliptree-----------	90	86	
							White oak-----------	---	---	

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Trees to plant
MOE:										
Mt. Airy	3F	Moderate	Moderate	Moderate	Slight	Slight	Virginia pine	65	100	Virginia pine, eastern white pine.
							Black oak	65	43	
							Chestnut oak	---	---	
							Hickory	---	---	
							Red maple	---	---	
							Tuliptree	70	57	
Manor	4R	Moderate	Moderate	Moderate	Slight	Slight	Virginia pine	80	114	Virginia pine, eastern white pine, shortleaf pine, tuliptree.
							Black oak	80	57	
							Blackgum	---	---	
							Chestnut oak	---	---	
							Hickory	---	---	
							Shortleaf pine	80	129	
							Southern red oak	---	---	
							Tuliptree	90	86	
							White oak	---	---	
MPD:										
Mt. Airy	3F	Moderate	Moderate	Moderate	Slight	Slight	Virginia pine	65	100	Virginia pine, eastern white pine.
							Black oak	65	43	
							Chestnut oak	---	---	
							Hickory	---	---	
							Red maple	---	---	
							Tuliptree	70	57	
Manor	4R	Moderate	Moderate	Moderate	Slight	Moderate	Virginia pine	80	114	Virginia pine, eastern white pine, shortleaf pine, tuliptree.
							Black oak	80	57	
							Blackgum	---	---	
							Chestnut oak	---	---	
							Hickory	---	---	
							Shortleaf pine	80	129	
							Southern red oak	---	---	
							Tuliptree	90	86	
							White oak	---	---	
MRF:										
Mt. Airy	3R	Severe	Severe	Moderate	Slight	Slight	Virginia pine	65	100	Virginia pine, eastern white pine.
							Black oak	65	43	
							Chestnut oak	---	---	
							Hickory	---	---	
							Red maple	---	---	
							Tuliptree	70	57	
Manor	4R	Severe	Severe	Moderate	Slight	Moderate	Virginia pine	80	114	Virginia pine, eastern white pine, shortleaf pine, tuliptree.
							Black oak	80	57	
							Blackgum	---	---	
							Chestnut oak	---	---	
							Hickory	---	---	
							Shortleaf pine	80	129	
							Southern red oak	---	---	
							Tuliptree	90	86	
							White oak	---	---	

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber*	Trees to plant
MvB:										
Murrill	4A	Slight	Slight	Slight	Slight	Moderate	Black walnut	---	---	Japanese larch,
							Eastern white pine	80	143	Norway spruce,
							Northern red oak	72	57	black walnut,
							Tuliptree	94	100	eastern white
							White ash	70	72	pine, tuliptree.
MvC:										
Murrill	4A	Slight	Slight	Slight	Slight	Moderate	Black walnut	---	---	Japanese larch,
							Eastern white pine	80	143	Norway spruce,
							Northern red oak	72	57	black walnut,
							Tuliptree	94	100	eastern white
							White ash	70	72	pine, tuliptree.
NaB:										
Neshaminy	4A	Slight	Slight	Slight	Slight	Severe	Northern red oak	80	57	Virginia pine,
							Tuliptree	90	86	black walnut,
										eastern white
										pine, tuliptree.
NaC:										
Neshaminy	4A	Slight	Slight	Slight	Slight	Severe	Northern red oak	80	57	Virginia pine,
							Tuliptree	90	86	black walnut,
										eastern white
										pine, tuliptree.
NdB:										
Neshaminy	4X	Slight	Moderate	Slight	Slight	Moderate	Northern red oak	80	57	Japanese larch,
							Tuliptree	90	86	Norway spruce,
										Virginia pine,
										black walnut,
										eastern white
										pine, tuliptree.
NdD:										
Neshaminy	4X	Slight	Moderate	Slight	Slight	Moderate	Northern red oak	80	57	Japanese larch,
							Tuliptree	90	86	Norway spruce,
										Virginia pine,
										black walnut,
										eastern white
										pine, tuliptree.
NdE:										
Neshaminy	4X	Slight	Moderate	Slight	Slight	Moderate	Northern red oak	80	57	Japanese larch,
							Tuliptree	90	86	Norway spruce,
										Virginia pine,
										black walnut,
										eastern white
										pine, tuliptree.
Pa:										
Penlaw	4W	Slight	Moderate	Moderate	Moderate	Severe	Northern red oak	80	57	Japanese larch,
							Red maple	80	57	Norway spruce,
							Sugar maple	80	57	eastern white
							Tuliptree	90	86	pine, tuliptree,
							White ash	80	57	white spruce.

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber*	Trees to plant
PbB:										
Penn	3A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	69	114	European larch,
							Northern red oak	67	43	Norway spruce,
							Shortleaf pine	70	114	Virginia pine,
							Tuliptree	75	57	loblolly pine,
										tuliptree.
PbD:										
Penn	3R	Slight	Moderate	Slight	Slight	Moderate	Virginia pine	69	114	European larch,
							Northern red oak	67	43	Norway spruce,
							Shortleaf pine	70	114	Virginia pine,
							Tuliptree	75	57	loblolly pine,
										tuliptree.
PcF:										
Penn	3R	Slight	Moderate	Slight	Slight	Moderate	Virginia pine	69	114	European larch,
							Northern red oak	67	43	Norway spruce,
							Shortleaf pine	70	114	Virginia pine,
							Tuliptree	75	57	loblolly pine,
										tuliptree.
PeB:										
Penn	3A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	69	114	Japanese larch,
							Northern red oak	67	43	Norway spruce,
							Shortleaf pine	70	114	Virginia pine,
							Tuliptree	75	57	tuliptree.
PeC:										
Penn	3A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	69	114	Japanese larch,
							Northern red oak	67	43	Norway spruce,
							Shortleaf pine	70	114	Virginia pine,
							Tuliptree	75	57	tuliptree.
PoB:										
Penn	3A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	69	114	Japanese larch,
							Northern red oak	67	43	Norway spruce,
							Shortleaf pine	70	114	Virginia pine,
							Tuliptree	75	57	tuliptree.
Klinesville	3D	Slight	Slight	Moderate	Slight	Moderate	Virginia pine	60	86	Virginia pine,
							Northern red oak	60	43	eastern white
										pine, pitch pine,
										red pine.
PoC:										
Penn	3A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	69	114	Japanese larch,
							Northern red oak	67	43	Norway spruce,
							Shortleaf pine	70	114	Virginia pine,
							Tuliptree	75	57	tuliptree.
Klinesville	3D	Slight	Slight	Moderate	Slight	Moderate	Virginia pine	60	86	Virginia pine,
							Northern red oak	60	43	eastern white
										pine, pitch pine,
										red pine.

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Trees to plant
PpB:										
Penn	3A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	69	114	Japanese larch,
							Northern red oak	67	43	Norway spruce,
							Shortleaf pine	70	114	Virginia pine,
							Tuliptree	75	57	tuliptree.
Lansdale	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	70	114	Norway spruce,
							Northern red oak	70	57	Virginia pine,
							Shortleaf pine	70	114	eastern white
							Tuliptree	75	57	pine, shortleaf
										pine, tuliptree.
PpC:										
Penn	3A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	69	114	Japanese larch,
							Northern red oak	67	43	Norway spruce,
							Shortleaf pine	70	114	Virginia pine,
							Tuliptree	75	57	tuliptree.
Lansdale	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	70	114	Norway spruce,
							Northern red oak	70	57	Virginia pine,
							Shortleaf pine	70	114	eastern white
							Tuliptree	75	57	pine, shortleaf
										pine, tuliptree.
PsB:										
Pequea	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	70	114	Japanese larch,
							Black oak	70	57	Norway spruce,
							Northern red oak	70	57	Virginia pine,
							Tuliptree	75	57	eastern white pine.
PsC:										
Pequea	4R	Moderate	Slight	Slight	Slight	Moderate	Virginia pine	70	114	Japanese larch,
							Black oak	70	57	Norway spruce,
							Northern red oak	70	57	Virginia pine,
							Tuliptree	75	57	eastern white pine.
PsD:										
Pequea	4R	Severe	Moderate	Slight	Slight	Moderate	Virginia pine	70	114	Japanese larch,
							Black oak	70	57	Norway spruce,
							Northern red oak	70	57	Virginia pine,
							Tuliptree	75	57	eastern white pine.
Pt**:										
Pits, quarries.										
RaA:										
Raritan	4A	Slight	Moderate	Slight	Slight	Severe	Virginia pine	75	114	Japanese larch,
							Northern red oak	70	57	Norway spruce,
							Shortleaf pine	75	114	Virginia pine,
							Tuliptree	80	72	eastern white
										pine, tuliptree.
RaB:										
Raritan	4A	Slight	Moderate	Slight	Slight	Severe	Virginia pine	75	114	Japanese larch,
							Northern red oak	70	57	Norway spruce,
							Shortleaf pine	75	114	Virginia pine,
							Tuliptree	80	72	eastern white
										pine, tuliptree.

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordi-nation symbol	Management concerns: Erosion hazard	Management concerns: Equip-ment limita-tion	Management concerns: Seedling mortal-ity	Management concerns: Wind-throw hazard	Management concerns: Plant competi-tion	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber*	Trees to plant
ReA:										
Readington	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	75	114	Japanese larch, Norway spruce, eastern white pine, tuliptree.
							Northern red oak	74	57	
							Shortleaf pine	75	114	
							Tuliptree	80	72	
ReB:										
Readington	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	75	114	Japanese larch, Norway spruce, eastern white pine, tuliptree.
							Northern red oak	74	57	
							Shortleaf pine	75	114	
							Tuliptree	80	72	
RfB:										
Reaville	4W	Slight	Moderate	Slight	Moderate	Severe	Virginia pine	75	114	Virginia pine, eastern white pine.
							Northern red oak	80	57	
RfC:										
Reaville	4W	Slight	Moderate	Slight	Moderate	Severe	Virginia pine	75	114	Virginia pine, eastern white pine.
							Northern red oak	80	57	
Rw:										
Rowland	4W	Slight	Moderate	Slight	Slight	Slight	Northern red oak	80	57	European larch, Norway spruce, eastern white pine, loblolly pine, tuliptree.
							Tuliptree	95	100	
StC:										
Steinsburg	8F	Slight	Slight	Moderate	Slight	Moderate	Virginia pine	70	114	European larch, Norway spruce, Virginia pine, eastern white pine.
							Northern red oak	---	---	
							Tuliptree	---	---	
StD:										
Steinsburg	8F	Moderate	Moderate	Moderate	Slight	Moderate	Virginia pine	70	114	European larch, Norway spruce, Virginia pine, eastern white pine.
							Northern red oak	---	---	
							Tuliptree	---	---	
Uc**:										
Urban land.										
UdB**:										
Urban land.										
Chester	4A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	80	114	Black walnut, eastern white pine, tuliptree.
							Southern red oak	80	57	
							Tuliptree	83	72	
UeB**:										
Urban land.										
Conestoga	5A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	85	72	Japanese larch, black walnut, eastern white pine, tuliptree.
							Tuliptree	95	100	

See footnotes at end of table.

Table 9.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber*	Trees to plant
UfC**:										
Urban land.										
Mt. Airy	3F	Slight	Slight	Moderate	Slight	Slight	Virginia pine	65	100	Virginia pine,
							Black oak	65	43	eastern white pine.
							Chestnut oak	---	---	
							Hickory	---	---	
							Red maple	---	---	
							Tuliptree	70	57	
UgB**:										
Urban land.										
Penn	3A	Slight	Slight	Slight	Slight	Moderate	Virginia pine	69	114	Japanese larch,
							Northern red oak	67	43	Norway spruce,
							Shortleaf pine	70	114	Virginia pine,
							Tuliptree	75	57	tuliptree.
WaA:										
Watchung	4W	Slight	Severe	Severe	Slight	Severe	Black oak	80	57	European larch,
							Pin oak	85	72	Norway spruce,
										eastern white pine.
WaB:										
Watchung	4W	Slight	Severe	Severe	Slight	Severe	Black oak	80	57	European larch,
							Pin oak	85	72	Norway spruce,
										eastern white pine.
WbB:										
Watchung	4X	Slight	Severe	Severe	Slight	Severe	Northern red oak	80	57	European larch,
							Pin oak	85	57	Norway spruce,
										eastern white pine.

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

Table 10.--Recreational Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil or miscellaneous area was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
ArB: Arendtsville	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, droughty.
ArC: Arendtsville	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: slope, small stones, droughty.
ArD: Arendtsville	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
AtB: Athol	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
AtC: Athol	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Ba: Baile	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Be: Bermudian	Severe: flooding.	Slight	Moderate: flooding.	Severe: erodes easily.	Moderate: flooding.
BgA: Birdsboro	Slight	Moderate: wetness.	Slight	Severe: erodes easily.	Slight.
BgB: Birdsboro	Slight	Moderate: wetness.	Moderate: slope.	Severe: erodes easily.	Slight.
BgC: Birdsboro	Moderate: small stones.	Moderate: slope, wetness.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Bo: Bowmansville	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.
BrB: Brecknock	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, droughty.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BrC:					
Brecknock	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty.
BrD:					
Brecknock	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
BsD:					
Brecknock	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: slope.
BsF:					
Brecknock	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
CcC:					
Catoctin	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight	Severe: small stones.
Cd:					
Chagrin	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
CeB:					
Chester	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.
CeC:					
Chester	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
CkA:					
Clarksburg	Moderate: wetness.	Moderate: wetness.	Moderate: small stones, wetness.	Severe: erodes easily.	Moderate: wetness.
CkB:					
Clarksburg	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones, wetness.	Severe: erodes easily.	Moderate: wetness.
Cm:					
Codorus	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding, wetness.	Moderate: wetness.	Severe: flooding.
CnA:					
Conestoga	Slight	Slight	Slight	Slight	Slight.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CnB:					
Conestoga	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
CnC:					
Conestoga	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
CrA:					
Croton	Severe: wetness.	Severe: wetness.	Severe: percs slowly, wetness.	Severe: erodes easily, wetness.	Severe: wetness.
CrB:					
Croton	Severe: wetness.	Severe: wetness.	Severe: percs slowly, wetness.	Severe: erodes easily, wetness.	Severe: wetness.
DuA:					
Duffield	Slight	Slight	Moderate: small stones.	Severe: erodes easily.	Slight.
DuB:					
Duffield	Slight	Slight	Moderate: slope, small stones.	Severe: erodes easily.	Severe: wetness, cutbanks cave.
DuC:					
Duffield	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
DWD:					
Duffield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Hagerstown	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Dx*:					
Dumps, refuse.					
EdB:					
Edgemont	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, droughty.
EdC:					
Edgemont	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty.
EdD:					
Edgemont	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
EeB:					
Edgemont	Moderate: large stones, small stones.	Moderate: large stones, small stones.	Severe: large stones, small stones.	Slight	Moderate: large stones, small stones.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
EeD: Edgemont	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: slope.
EeF: Edgemont	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
EkA: Elk	Slight	Slight	Slight	Severe: erodes easily.	Slight.
EkB: Elk	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
GbB: Glenelg	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
GbC: Glenelg	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: slope, small stones.
GbD: Glenelg	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
GdA: Glenville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
GdB: Glenville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
HaA: Hagerstown	Slight	Slight	Moderate: small stones.	Slight	Moderate: large stones.
HaB: Hagerstown	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.
HaC: Hagerstown	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
Hc: Hatboro	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
HgB:					
Highfield	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
HgC:					
Highfield	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: slope, small stones.
HHD:					
Highfield	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Catoctin	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.	Severe: slope, small stones.
HKD:					
Highfield	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: slope.
Catoctin	Severe: large stones, slope.	Severe: large stones, slope.	Severe: large stones, slope.	Moderate: large stones, slope.	Severe: large stones, slope.
Myersville	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Moderate: slope.	Severe: slope.
KnD:					
Klinesville	Severe: slope, small stones, depth to rock	Severe: slope, small stones, depth to rock	Severe: slope, small stones, depth to rock	Moderate: slope.	Severe: slope, small stones, depth to rock.
KnE:					
Klinesville	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: slope, small stones, depth to rock.
Lc:					
Lamington	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
LeB:					
Lansdale	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
LfC:					
Lansdale	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones, droughty.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
LgB: Legore	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
LgC: Legore	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
LgD: Legore	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
LhA: Lehigh	Severe: wetness.	Severe: wetness.	Severe: small stones, wetness.	Severe: wetness.	Severe: wetness.
LhB: Lehigh	Severe: wetness.	Severe: wetness.	Severe: small stones, wetness.	Severe: wetness.	Severe: wetness.
LhC: Lehigh	Severe: wetness.	Severe: wetness.	Severe: slope, small stones, wetness.	Severe: wetness.	Severe: wetness.
LhD: Lehigh	Severe: slope, wetness.	Severe: slope, wetness.	Severe: slope, small stones, wetness.	Severe: wetness.	Severe: slope, wetness.
LkB: Lehigh	Severe: wetness.	Severe: wetness.	Severe: large stones, small stones.	Severe: wetness.	Severe: wetness.
LrB: Lewisberry	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: large stones, small stones.
LrC: Lewisberry	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: large stones, slope.
LSD: Lewisberry	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: slope.
Lansdale	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: slope.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Lw:					
Lindside	Severe: flooding.	Moderate: flooding, percs slowly, wetness.	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.
MdA:					
Mount Lucas	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: erodes easily, wetness.	Severe: wetness.
MdB:					
Mount Lucas	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: erodes easily, wetness.	Severe: wetness.
MeB:					
Mount Lucas	Severe: wetness.	Severe: wetness.	Severe: large stones, small stones.	Severe: wetness.	Severe: wetness.
MOB:					
Mt. Airy	Severe: small stones.	Severe: small stones.	Severe: small stones.	Slight	Severe: small stones.
Manor	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Severe: erodes easily.	Moderate: small stones.
MOC:					
Mt. Airy	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight	Severe: small stones.
Manor	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Severe: erodes easily.	Moderate: slope, small stones.
MOD:					
Mt. Airy	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.	Severe: slope, small stones.
Manor	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: erodes easily.	Severe: slope.
MOE:					
Mt. Airy	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones.
Manor	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: erodes easily, slope.	Severe: slope.
MPD:					
Mt. Airy	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: slope, small stones.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
MPD:					
Manor	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: slope.
MRF:					
Mt. Airy	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope, small stones.
Manor	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
MvB:					
Murrill	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
MvC:					
Murrill	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: slope, small stones.
NaB:					
Neshaminy	Moderate: percs slowly, small stones.	Moderate: percs slowly, small stones.	Severe: small stones.	Slight	Moderate: large stones, small stones.
NaC:					
Neshaminy	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones.
NdB:					
Neshaminy	Severe: large stones.	Severe: large stones.	Severe: large stones, small stones.	Slight	Moderate: large stones, small stones.
NdD:					
Neshaminy	Severe: large stones, slope.	Severe: large stones, slope.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: slope.
NdE:					
Neshaminy	Severe: large stones, slope.	Severe: large stones, slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
Pa:					
Penlaw	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: erodes easily, wetness.	Severe: wetness.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
PbB:					
Penn	Moderate: large stones, small stones.	Moderate: large stones, small stones.	Severe: large stones, small stones.	Slight	Moderate: large stones, small stones.
PbD:					
Penn	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: slope.
PcF:					
Penn	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
PeB:					
Penn	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: depth to rock.
PeC:					
Penn	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, depth to rock.
PoB:					
Penn	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, depth to rock.
Klinesville	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Slight	Severe: small stones, depth to rock.
PoC:					
Penn	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: slope, small stones.
Klinesville	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Slight	Severe: small stones, depth to rock.
PpB:					
Penn	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: depth to rock.
Lansdale	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
PpC:					
Penn	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: slope, small stones.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
PpC:					
Lansdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope, droughty.
PsB:					
Pequea	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
PsC:					
Pequea	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
PsD:					
Pequea	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Pt*:					
Pits, quarries.					
RaA:					
Raritan	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: erodes easily, wetness.	Severe: wetness.
RaB:					
Raritan	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: erodes easily, wetness.	Severe: wetness.
ReA:					
Readington	Moderate: wetness.	Moderate: wetness.	Moderate: small stones, wetness.	Severe: erodes easily.	Moderate: wetness.
ReB:					
Readington	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones.	Severe: erodes easily.	Moderate: wetness.
RfB:					
Reaville	Severe: wetness.	Severe: wetness.	Severe: small stones, wetness.	Severe: wetness.	Severe: wetness.
RfC:					
Reaville	Severe: wetness.	Severe: wetness.	Severe: slope, small stones, wetness.	Severe: wetness.	Severe: wetness.
Rw:					
Rowland	Severe: flooding, wetness.	Moderate: flooding, percs slowly, wetness.	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
StC:					
Steinsburg	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: slope, small stones, droughty.
StD:					
Steinsburg	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Uc*:					
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
UdB*:					
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Chester	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.
UeB*:					
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Conestoga	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
UfC*:					
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Mt. Airy	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight	Severe: small stones.
UgB*:					
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Penn	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: depth to rock.
WaA:					
Watchung	Severe: percs slowly, wetness.	Severe: percs slowly, wetness.	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.
WaB:					
Watchung	Severe: percs slowly, wetness.	Severe: percs slowly, wetness.	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
WbB:					
Watchung---------------	Severe: large stones, percs slowly, wetness.	Severe: large stones, percs slowly, wetness.	Severe: large stones, wetness.	Severe: large stones, wetness.	Severe: large stones, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 11.--Wildlife Habitat

(See text for definitions of "good," "fair," and "poor." Absence of an entry indicates that the soil or miscellaneous area was not rated)

Map symbol and soil name	Potential for habitat elements							Potential as habitat for		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life
ArB:										
Arendtsville	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ArC:										
Arendtsville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ArD:										
Arendtsville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
AtB:										
Athol	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AtC:										
Athol	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Ba:										
Baile	Poor	Fair	Good	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Be:										
Bermudian	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BgA:										
Birdsboro	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BgB:										
Birdsboro	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BgC:										
Birdsboro	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Bo:										
Bowmansville	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
BrB:										
Brecknock	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BrC:										
Brecknock	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BrD:										
Brecknock	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
BsD: Brecknock	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BsF: Brecknock	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CcC: Catoctin	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
Cd: Chagrin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CeB: Chester	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CeC: Chester	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CkA: Clarksburg	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CkB: Clarksburg	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Cm: Codorus	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CnA: Conestoga	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CnB: Conestoga	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CnC: Conestoga	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CrA: Croton	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
CrB: Croton	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Very poor.	Good.
DuA: Duffield	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
DuB:										
Duffield----------------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
DuC:										
Duffield----------------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
DWD:										
Duffield----------------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Hagerstown--------------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Dx*:										
Dumps, refuse.										
EdB:										
Edgemont----------------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EdC:										
Edgemont----------------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EdD:										
Edgemont----------------	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
EeB:										
Edgemont----------------	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
EeD:										
Edgemont----------------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
EeF:										
Edgemont----------------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
EkA:										
Elk---------------------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EkB:										
Elk---------------------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GbB:										
Glenelg-----------------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GbC:										
Glenelg-----------------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
GbD:										
Glenelg	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
GdA:										
Glenville	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
GdB:										
Glenville	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HaA:										
Hagerstown	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
HaB:										
Hagerstown	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
HaC:										
Hagerstown	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Hc:										
Hatboro	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
HgB:										
Highfield	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HgC:										
Highfield	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HHD:										
Highfield	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Catoctin	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
HKD:										
Highfield	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Catoctin	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Myersville	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
KnD:										
Klinesville	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
KnE:										
Klinesville	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.

See footnote at end of table.

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
Lc: Lamington	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
LeB: Lansdale	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LfC: Lansdale	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LgB: Legore	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LgC: Legore	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LgD: Legore	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
LhA: Lehigh	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
LhB: Lehigh	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LhC: Lehigh	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LhD: Lehigh	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
LkB: Lehigh	Very poor.	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
LrB: Lewisberry	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LrC: Lewisberry	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LSD: Lewisberry	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Lansdale	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

See footnote at end of table.

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
Lw:										
Lindside	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
MdA:										
Mount Lucas	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MdB:										
Mount Lucas	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MeB:										
Mount Lucas	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
MOB:										
Mt. Airy	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Manor	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MOC:										
Mt. Airy	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Manor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MOD:										
Mt. Airy	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Manor	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MOE:										
Mt. Airy	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Manor	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
MPD:										
Mt. Airy	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Manor	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
MRF:										
Mt. Airy	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Manor	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

See footnote at end of table.

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
MvB: Murrill	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MvC: Murrill	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
NaB: Neshaminy	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
NaC: Neshaminy	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
NdB: Neshaminy	Very poor.	Very poor.	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
NdD: Neshaminy	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
NdE: Neshaminy	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Pa: Penlaw	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
PbB: Penn	Very poor.	Poor	Good	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
PbD: Penn	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
PcF: Penn	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
PeB: Penn	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
PeC: Penn	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
PoB: Penn	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
Klinesville	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.

See footnote at end of table.

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
PoC:										
Penn	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Klinesville	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
PpB:										
Penn	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
Lansdale	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
PpC:										
Penn	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Lansdale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
PsB:										
Pequea	Fair	Good	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
PsC:										
Pequea	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
PsD:										
Pequea	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Pt*:										
Pits, quarries.										
RaA:										
Raritan	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
RaB:										
Raritan	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ReA:										
Readington	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
ReB:										
Readington	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RfB:										
Reaville	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor	Very poor.
RfC:										
Reaville	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.

See footnote at end of table.

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
Rw:										
Rowland	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
StC:										
Steinsburg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
StD:										
Steinsburg	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Uc*:										
Urban land.										
UdB*:										
Urban land.										
Chester	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
UeB*:										
Urban land.										
Conestoga	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
UfC*:										
Urban land.										
Mt. Airy	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
UgB*:										
Urban land										
Penn	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
WaA:										
Watchung	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
WaB:										
Watchung	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
WbB:										
Watchung	Very poor.	Very poor.	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 12.--Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil or miscellaneous area was not rated. Data below indicate the dominant soil condition, but do not eliminate the need for onsite investigation)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
ArB:						
Arendtsville	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action	Moderate: small stones, droughty.
ArC:						
Arendtsville	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope, small stones, droughty.
ArD:						
Arendtsville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
AtB:						
Athol	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
AtC:						
Athol	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope.
Ba:						
Baile	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
Be:						
Bermudian	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, low strength.	Moderate: flooding.
BgA:						
Birdsboro	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: frost action, wetness.	Slight.
BgB:						
Birdsboro	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: frost action, wetness.	Slight.
BgC:						
Birdsboro	Severe: wetness, cutbanks cave.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope.	Moderate: frost action, slope, wetness.	Moderate: slope.
Bo:						
Bowmansville	Severe: wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action, wetness.	Severe: flooding, wetness.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BrB:						
Brecknock	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: small stones, droughty.
BrC:						
Brecknock	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: frost action, slope.	Moderate: small stones, droughty.
BrD:						
Brecknock	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BsD:						
Brecknock	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BsF:						
Brecknock	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CcC:						
Catoctin	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock.	Severe: small stones.
Cd:						
Chagrin	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
CeB:						
Chester	Slight	Slight	Slight	Moderate: slope.	Severe: low strength.	Moderate: large stones.
CeC:						
Chester	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: large stones, slope.
CkA:						
Clarksburg	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Moderate: low strength, shrink-swell.	Moderate: wetness.
CkB:						
Clarksburg	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Moderate: low strength, shrink-swell.	Moderate: wetness.
Cm:						
Codorus	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CnA:						
Conestoga	Slight	Slight	Slight	Slight	Moderate: frost action, low strength.	Slight.
CnB:						
Conestoga	Slight	Slight	Slight	Moderate: slope.	Severe: low strength.	Slight.
CnC:						
Conestoga	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
CrA:						
Croton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.
CrB:						
Croton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.
DuA:						
Duffield	Moderate: too clayey, depth to rock.	Moderate: shrink-swell.	Moderate: shrink-swell, depth to rock.	Moderate: shrink-swell.	Severe: low strength.	Slight.
DuB:						
Duffield	Moderate: too clayey, depth to rock.	Moderate: shrink-swell.	Moderate: shrink-swell, depth to rock.	Moderate: shrink-swell, slope.	Severe: low strength.	Severe: wetness, cutbanks cave.
DuC:						
Duffield	Moderate: slope, too clayey, depth to rock.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope, depth to rock.	Severe: slope.	Severe: low strength.	Moderate: slope.
DWD:						
Duffield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Hagerstown	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Dx*:						
Dumps, refuse.						
EdB:						
Edgemont	Severe: cutbanks cave.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: small stones, droughty.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
EdC:						
Edgemont	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: frost action, slope.	Moderate: small stones, droughty.
EdD:						
Edgemont	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
EeB:						
Edgemont	Severe: cutbanks cave.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: large stones, small stones.
EeD:						
Edgemont	Severe: slope. cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
EeF:						
Edgemont	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
EkA:						
Elk	Moderate: too clayey.	Slight	Slight	Slight	Severe: low strength.	Slight.
EkB:						
Elk	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Severe: low strength.	Slight.
GbB:						
Glenelg	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: large stones, slope.	Moderate: frost action, large stones.	Moderate: small stones.
GbC:						
Glenelg	Moderate: large stones, slope.	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope, small stones.
GbD:						
Glenelg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
GdA:						
Glenville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
GdB:						
Glenville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HaA:						
Hagerstown	Moderate: too clayey, depth to rock.	Moderate: shrink-swell.	Moderate: shrink-swell, depth to rock.	Moderate: shrink-swell.	Severe: low strength.	Moderate: large stones.
HaB:						
Hagerstown	Moderate: too clayey, depth to rock.	Moderate: shrink-swell.	Moderate: shrink-swell, depth to rock.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: large stones.
HaC:						
Hagerstown	Moderate: slope, too clayey, depth to rock.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope, depth to rock.	Severe: slope.	Severe: low strength.	Moderate: large stones, slope.
Hc:						
Hatboro	Severe: wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action, wetness.	Severe: flooding, wetness.
HgB:						
Highfield	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: small stones.
HgC:						
Highfield	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope, small stones.
HHD:						
Highfield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Catoctin	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
HKD:						
Highfield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Catoctin	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: large stones, slope.
Myersville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
KnD:						
Klinesville	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones, depth to rock.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
KnE:						
Klinesville	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones, depth to rock.
Lc:						
Lamington	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
LeB:						
Lansdale	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: droughty.
LfC:						
Lansdale	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: large stones, droughty.
LgB:						
Legore	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
LgC:						
Legore	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: small stones.
LgD:						
Legore	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
LhA:						
Lehigh	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
LhB:						
Lehigh	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
LhC:						
Lehigh	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: frost action, wetness.	Severe: wetness.
LhD:						
Lehigh	Severe: slope, wetness.	Severe: slope, wetness.	Severe: slope, wetness.	Severe: slope, wetness.	Severe: frost action, slope, wetness.	Severe: slope, wetness.
LkB:						
Lehigh	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LrB:						
Lewisberry	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: large stones, small stones.
LrC:						
Lewisberry	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: frost action, slope.	Moderate: large stones, slope.
LSD:						
Lewisberry	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lansdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lw:						
Lindside	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action, low strength.	Severe: flooding.
MdA:						
Mount Lucas	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
MdB:						
Mount Lucas	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
MeB:						
Mount Lucas	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
MOB:						
Mt. Airy	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action,	Severe: small stones.
Manor	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: small stones.
MOC:						
Mt. Airy	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: frost action, slope.	Severe: small stones.
Manor	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope, small stones.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MOD:						
Mt. Airy	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Manor	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MOE:						
Mt. Airy	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Manor	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MPD:						
Mt. Airy	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Manor	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MRF:						
Mt. Airy	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Manor	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MvB:						
Murrill	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action, low strength.	Moderate: small stones.
MvC:						
Murrill	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: frost action, low strength, slope.	Moderate: slope, small stones.
NaB:						
Neshaminy	Moderate: large stones, depth to rock.	Moderate: large stones.	Moderate: large stones, depth to rock.	Moderate: large stones, slope.	Moderate: frost action, large stones.	Moderate: large stones, small stones.
NaC:						
Neshaminy	Moderate: large stones, slope, depth to rock.	Moderate: large stones, slope.	Moderate: large stones, slope, depth to rock.	Severe: slope.	Moderate: frost action, large stones, slope.	Moderate: small stones.
NdB:						
Neshaminy	Moderate: large stones, depth to rock.	Moderate: large stones.	Moderate: large stones, depth to rock.	Moderate: large stones, slope.	Moderate: frost action, large stones.	Moderate: large stones, small stones.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
NdD:						
Neshaminy	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
NdE:						
Neshaminy	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Pa:						
Penlaw	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.
PbB:						
Penn	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: large stones, small stones.
PbD:						
Penn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PcF:						
Penn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PeB:						
Penn	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: depth to rock.
PeC:						
Penn	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope, depth to rock.
PoB:						
Penn	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: small stones, depth to rock.
Klinesville	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: frost action, depth to rock.	Severe: small stones, depth to rock.
PoC:						
Penn	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope, small stones.
Klinesville	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: frost action, slope, depth to rock.	Severe: small stones, depth to rock.
PpB:						
Penn	Moderate: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: depth to rock.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
PpB:						
Lansdale	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: droughty.
PpC:						
Penn	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope, small stones.
Lansdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: frost action, slope.	Moderate: large stones, slope, droughty.
PsB:						
Pequea	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Slight.
PsC:						
Pequea	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope.
PsD:						
Pequea	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Pt*:						
Pits, quarries.						
RaA:						
Raritan	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
RaB:						
Raritan	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
ReA:						
Readington	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Moderate: wetness.
ReB:						
Readington	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: low strength, wetness.	Moderate: wetness.
RfB:						
Reaville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
RfC:						
Reaville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: slope. wetness.	Severe: frost action, wetness.	Severe: wetness.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Rw:						
Rowland	Severe: wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
StC:						
Steinsburg	Severe: cutbanks cave.	Moderate: large stones, slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: large stones, slope.	Moderate: slope, small stones, droughty.
StD:						
Steinsburg	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Uc*:						
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
UdB*:						
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Chester	Slight	Slight	Slight	Moderate: slope.	Severe: low strength.	Moderate: large stones.
UeB*:						
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Conestoga	Slight	Slight	Slight	Moderate: slope.	Severe: low strength.	Slight.
UfC*:						
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Mt. Airy	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: frost action, slope.	Severe: small stones.
UgB*:						
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Penn	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: depth to rock.
WaA:						
Watchung	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
WaB:						
Watchung	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.
WbB:						
Watchung	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: large stones, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 13.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil or miscellaneous area was not rated. Information in this table indicates the dominant soil condition, but does not eliminate the need for onsite investigation.)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
ArB:					
Arendtsville	Moderate: percs slowly, depth to rock.	Severe: seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Poor: small stones.
ArC:					
Arendtsville	Moderate: percs slowly, slope, depth to rock.	Severe: seepage, slope,	Severe: seepage, depth to rock.	Severe: seepage.	Poor: small stones.
ArD:					
Arendtsville	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope.	Poor: slope, small stones.
AtB:					
Athol	Moderate: percs slowly, depth to rock.	Moderate: seepage, slope.	Severe: depth to rock.	Slight	Fair: small stones, too clayey.
AtC:					
Athol	Moderate: percs slowly, slope, depth to rock.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Fair: slope, small stones, too clayey.
Ba:					
Baile	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
Be:					
Bermudian	Severe: flooding, wetness, poor filter.	Severe: flooding, seepage.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: small stones, too clayey, wetness.
BgA:					
Birdsboro	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: small stones, too clayey.
BgB:					
Birdsboro	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: small stones, too clayey.
BgC:					
Birdsboro	Severe: wetness.	Severe: seepage, slope, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: slope, small stones, too clayey.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Bo:					
Bowmansville	Severe: flooding, percs slowly, wetness.	Severe: flooding, seepage.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.
BrB:					
Brecknock	Moderate: percs slowly, depth to rock.	Moderate: seepage, slope, depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Poor: small stones.
BrC:					
Brecknock	Moderate: percs slowly, slope, depth to rock.	Severe: slope.	Severe: depth to rock.	Moderate: slope, depth to rock.	Poor: small stones.
BrD:					
Brecknock	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, small stones.
BsD:					
Brecknock	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, small stones.
BsF:					
Brecknock	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, small stones.
CcC:					
Catoctin	Severe: depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock.
Cd:					
Chagrin	Severe: flooding.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Fair: thin layer.
CeB:					
Chester	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey	Slight	Fair: small stones, too clayey.
CeC:					
Chester	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey	Moderate: slope.	Fair: slope, small stones, too clayey.
CkA:					
Clarksburg	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness, depth to rock.	Moderate: wetness.	Poor: small stones.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CkB:					
Clarksburg	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness, depth to rock.	Moderate: wetness.	Poor: small stones.
Cm:					
Codorus	Severe: flooding, wetness, poor filter.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
CnA:					
Conestoga	Moderate: percs slowly	Moderate: seepage.	Severe: depth to rock.	Slight	Fair: too clayey.
CnB:					
Conestoga	Moderate: percs slowly	Moderate: seepage, slope.	Moderate: too clayey	Slight	Poor: hard to pack.
CnC:					
Conestoga	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey	Moderate: slope.	Poor: hard to pack.
CrA:					
Croton	Severe: percs slowly, wetness.	Moderate: depth to rock.	Severe: wetness, depth to rock.	Severe: wetness.	Poor: wetness.
CrB:					
Croton	Severe: percs slowly, wetness.	Moderate: slope, depth to rock.	Severe: wetness, depth to rock.	Severe: wetness.	Poor: wetness.
DuA:					
Duffield	Moderate: percs slowly, depth to rock.	Moderate: seepage, depth to rock.	Severe: too clayey depth to rock.	Moderate: depth to rock.	Poor: hard to pack, too clayey.
DuB:					
Duffield	Moderage: percs slowly, depth to rock.	Moderate: seepage, slope, depth to rock.	Severe: too clayey depth to rock.	Moderate: depth to rock.	Poor: hard to pack, too clayey.
DuC:					
Duffield	Moderate: percs slowly, slope, depth to rock.	Severe: slope.	Severe: too clayey depth to rock.	Moderate: slope, depth to rock.	Poor: hard to pack, too clayey.
DWD:					
Duffield	Severe: slope.	Severe: slope.	Severe: slope, too clayey depth to rock.	Severe: slope.	Poor: hard to pack, slope, too clayey.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
DWD:					
Hagerstown	Severe: slope.	Severe: slope.	Severe: slope, too clayey depth to rock.	Severe: slope.	Poor: hard to pack, slope, too clayey.
Dx*:					
Dumps, refuse.					
EdB:					
Edgemont	Moderate: percs slowly, depth to rock.	Severe: seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Poor: seepage, small stones.
EdC:					
Edgemont	Moderate: percs slowly, slope, depth to rock.	Severe: seepage, slope.	Severe: seepage, depth to rock.	Severe: seepage.	Poor: seepage, small stones.
EdD:					
Edgemont	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope.	Poor: seepage, slope, small stones.
EeB:					
Edgemont	Moderate: percs slowly, depth to rock.	Severe: seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Poor: seepage, small stones.
EeD:					
Edgemont	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope.	Poor: seepage, slope, small stones.
EeF:					
Edgemont	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope.	Poor: seepage, slope, small stones.
EkA:					
Elk	Moderate: percs slowly	Moderate: seepage.	Moderate: too clayey	Slight	Fair: thin layer, too clayey.
EkB:					
Elk	Moderate: percs slowly	Moderate: seepage, slope.	Moderate: too clayey	Slight	Fair: thin layer, too clayey.
GbB:					
Glenelg	Moderate: large stones percs slowly	Moderate: seepage, slope.	Moderate: large stones	Slight	Poor: large stones, seepage.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
GbC:					
Glenelg	Moderate: percs slowly, slope.	Severe: slope.	Moderate: large stones slope.	Moderate: slope.	Poor: large stones, seepage.
GbD:					
Glenelg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: large stones, seepage, slope.
GdA:					
Glenville	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness, depth to rock.	Severe: wetness.	Poor: wetness.
GdB:					
Glenville	Severe: percs slowly, wetness,	Severe: wetness.	Severe: wetness, depth to rock.	Severe: wetness.	Poor: wetness.
HaA:					
Hagerstown	Moderate: percs slowly, depth to rock.	Moderate: seepage, depth to rock.	Severe: too clayey depth to rock.	Moderate: depth to rock.	Poor: hard to pack, too clayey.
HaB:					
Hagerstown	Moderate: percs slowly, depth to rock.	Moderate: seepage, slope, depth to rock.	Severe: too clayey depth to rock.	Moderate: depth to rock.	Poor: hard to pack, too clayey.
HaC:					
Hagerstown	Moderate: percs slowly, slope, depth to rock.	Severe: slope.	Severe: too clayey depth to rock.	Moderate: slope, depth to rock.	Poor: hard to pack, too clayey.
Hc:					
Hatboro	Severe: flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
HgB:					
Highfield	Moderate: percs slowly, depth to rock.	Moderate: seepage, slope, depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Poor: small stones.
HgC:					
Highfield	Moderate: percs slowly, slope, depth to rock.	Severe: slope.	Severe: depth to rock.	Moderate: slope, depth to rock.	Poor: small stones.
HHD:					
Highfield	Severe: slope,	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, small stones.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HHD:					
Catoctin	Severe: slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Poor: slope, small stones, depth to rock.
HKD:					
Highfield	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, small stones.
Catoctin	Severe: slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Poor: slope, small stones, depth to rock.
Myersville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
KnD:					
Klinesville	Severe: slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: slope, depth to rock.	Poor: seepage, small stones, depth to rock.
KnE:					
Klinesville	Severe: slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: slope, depth to rock.	Poor: seepage, small stones, depth to rock.
Lc:					
Lamington	Severe: percs slowly, wetness.	Severe: seepage.	Severe: seepage, wetness.	Severe: wetness.	Poor: small stones, wetness.
LeB:					
Lansdale	Moderate: percs slowly, depth to rock.	Severe: seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Fair: area reclaim, small stones.
LfC:					
Lansdale	Moderate: percs slowly, depth to rock.	Severe: seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Fair: area reclaim, small stones.
LgB:					
Legore	Moderate: percs slowly	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
LgC:					
Legore	Moderate: percs slowly	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
LgD:					
Legore	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope, small stones.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LhA:					
Lehigh	Severe: percs slowly, wetness.	Moderate: depth to rock.	Severe: wetness. depth to rock.	Severe: wetness.	Poor: small stones, wetness.
LhB:					
Lehigh	Severe: percs slowly, wetness.	Moderate: slope, depth to rock.	Severe: wetness. depth to rock.	Severe: wetness.	Poor: small stones, wetness.
LhC:					
Lehigh	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness. depth to rock.	Severe: wetness.	Poor: small stones, wetness.
LhD:					
Lehigh	Severe: percs slowly, slope, wetness.	Severe: slope.	Severe: slope, wetness. depth to rock.	Severe: slope, wetness.	Poor: slope, small stones, wetness.
LkB:					
Lehigh	Severe: percs slowly, wetness.	Moderate: slope, depth to rock.	Severe: wetness. depth to rock.	Severe: wetness.	Poor: small stones, wetness.
LrB:					
Lewisberry	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
LrC:					
Lewisberry	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
LSD:					
Lewisberry	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope, small stones.
Lansdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope.	Poor: slope.
Lw:					
*Lindside	Severe: flooding, percs slowly, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
MdA:					
Mount Lucas	Severe: percs slowly, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, depth to rock.	Severe: seepage, wetness.	Poor: small stones, wetness.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MdB:					
Mount Lucas	Severe: percs slowly, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness. depth to rock.	Severe: seepage, wetness.	Poor: small stones, wetness.
MeB:					
Mount Lucas	Severe: percs slowly, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness. depth to rock.	Severe: seepage, wetness.	Poor: small stones, wetness.
MOB:					
Mt. Airy	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: seepage, small stones, depth to rock.
Manor	Moderate: percs slowly	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
MOC:					
Mt. Airy	Severe: depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: seepage, small stones, depth to rock.
Manor	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
MOD:					
Mt. Airy	Severe: slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Poor: seepage, small stones, depth to rock.
Manor	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope, small stones.
MOE:					
Mt. Airy	Severe: slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Poor: seepage, small stones, depth to rock.
Manor	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope, small stones.
MPD:					
Mt. Airy	Severe: slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Poor: seepage, small stones, depth to rock.
Manor	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MRF:					
Mt. Airy	Severe: slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Poor: seepage, small stones, depth to rock.
Manor	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
MvB:					
Murrill	Moderate: percs slowly	Moderate: seepage, slope.	Moderate: too clayey	Slight	Poor: small stones.
MvC:					
Murrill	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey	Moderate: slope.	Poor: small stones.
NaB:					
Neshaminy	Severe: percs slowly	Moderate: large stones slope, depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Poor: hard to pack, small stones.
NaC:					
Neshaminy	Severe: percs slowly	Severe: slope.	Severe: depth to rock.	Moderate: slope, depth to rock.	Poor: hard to pack, small stones.
NdB:					
Neshaminy	Severe: percs slowly	Moderate: large stones slope, depth to rock.	Severe: large stones depth to rock.	Moderate: depth to rock.	Poor: hard to pack, small stones.
NdD:					
Neshaminy	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: hard to pack, slope, small stones.
NdE:					
Neshaminy	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: hard to pack, slope, small stones.
Pa:					
Penlaw	Severe: percs slowly, wetness.	Moderate: seepage, depth to rock.	Severe: wetness, depth to rock.	Severe: wetness.	Poor: hard to pack, wetness.
PbB:					
Penn	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
PbD:					
Penn	Severe: slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Poor: slope, small stones, depth to rock.
PcF:					
Penn	Severe: slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Poor: slope, small stones, depth to rock.
PeB:					
Penn	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock.
PeC:					
Penn	Severe: depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock.
PoB:					
Penn	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock.
Klinesville	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock.	Poor: seepage, small stones, depth to rock.
PoC:					
Penn	Severe: depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock.
Klinesville	Severe: depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock.	Poor: seepage, small stones, depth to rock.
PpB:					
Penn	Severe: slope, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock.
Lansdale	Moderate: percs slowly, depth to rock.	Severe: seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Fair: area reclaim, small stones.
PpC:					
Penn	Severe: depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
PpC: Lansdale	Moderate: percs slowly, slope, depth to rock.	Severe: seepage, slope.	Severe: seepage, depth to rock.	Severe: seepage.	Fair: area reclaim, slope, small stones.
PsB: Pequea	Moderate: depth to rock.	Severe: seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Fair: area reclaim, small stones.
PsC: Pequea	Moderate: slope, depth to rock.	Severe: seepage, slope,	Severe: seepage, depth to rock.	Severe: seepage.	Fair: area reclaim, slope, small stones.
PsD: Pequea	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope.	Poor: slope.
Pt*: Pits, quarries.					
RaA: Raritan	Severe: percs slowly, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
RaB: Raritan	Severe: percs slowly, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
ReA: Readington	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness, depth to rock.	Moderate: wetness, depth to rock.	Poor: small stones.
ReB: Readington	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness, depth to rock.	Moderate: wetness, depth to rock.	Poor: small stones.
RfB: Reaville	Severe: percs slowly, wetness, depth to rock.	Severe: wetness, depth to rock.	Severe: wetness, depth to rock.	Severe: wetness, depth to rock.	Poor: small stones, wetness, depth to rock.
RfC: Reaville	Severe: percs slowly, wetness, depth to rock.	Severe: slope, wetness, depth to rock.	Severe: wetness, depth to rock.	Severe: wetness, depth to rock.	Poor: small stones, wetness, depth to rock.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Rw:					
Rowland	Severe: flooding, percs slowly, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
StC:					
Steinsburg	Severe: depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock.
StD:					
Steinsburg	Severe: slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Poor: slope, small stones, depth to rock.
Uc*:					
Urban land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable.
UdB*:					
Urban land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable.
Chester	Moderate: percs slowly	Moderate: seepage, slope.	Moderate: too clayey	Slight	Fair: small stones, too clayey.
UeB*:					
Urban land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable.
Conestoga	Moderate: percs slowly	Moderate: seepage, slope.	Moderate: too clayey	Slight	Poor: hard to pack.
UfC*:					
Urban land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable.
Mt. Airy	Severe: depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: seepage, small stones, depth to rock.
UgB*:					
Urban land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable.
Penn	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock.
WaA:					
Watchung	Severe: percs slowly, wetness.	Moderate: seepage.	Severe: too clayey wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
WaB:					
Watchung	Severe: percs slowly, wetness.	Moderate: seepage, slope.	Severe: too clayey wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.
WbB:					
Watchung	Severe: percs slowly, wetness.	Severe: large stones	Severe: too clayey wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 14.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil or miscellaneous area was not rated. Information in this table indicates the dominant soil condition, but does not eliminate the need for onsite investigation)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
ArB:				
Arendtsville	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
ArC:				
Arendtsville	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
ArD:				
Arendtsville	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
AtB:				
Athol	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
AtC:				
Athol	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Ba:				
Baile	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Be:				
Bermudian	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
BgA:				
Birdsboro	Fair: wetness.	Probable	Probable	Poor: area reclaim, small stones.
BgB:				
Birdsboro	Fair: wetness.	Probable	Probable	Poor: area reclaim, small stones.
BgC:				
Birdsboro	Fair: wetness.	Probable	Probable	Poor: area reclaim, small stones.
Bo:				
Bowmansville	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, wetness.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
BrB:				
Brecknock	Fair: thin layer, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
BrC:				
Brecknock	Fair: thin layer, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
BrD:				
Brecknock	Fair: slope, thin layer, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
BsD:				
Brecknock	Fair: slope, thin layer, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
BsF:				
Brecknock	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
CcC:				
Catoctin	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Cd:				
Chagrin	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
CeB:				
Chester	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CeC:				
Chester	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CkA:				
Clarksburg	Fair: shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
CkB:				
Clarksburg	Fair: shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
Cm:				
Codorus	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
CnA:				
Conestoga	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
CnB:				
Conestoga	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
CnC:				
Conestoga	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, slope, small stones.
CrA:				
Croton	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
CrB:				
Croton	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
DuA:				
Duffield	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, too clayey.
DuB:				
Duffield	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, too clayey.
DuC:				
Duffield	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, too clayey.
DWD:				
Duffield	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, too clayey.
Hagerstown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Dx*:				
Dumps, refuse.				
EdB:				
Edgemont	Fair: depth to rock.	Probable	Probable	Poor: area reclaim, small stones.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
EdC:				
Edgemont	Fair: depth to rock.	Probable	Probable	Poor: area reclaim, small stones.
EdD:				
Edgemont	Fair: slope, depth to rock.	Probable	Probable	Poor: area reclaim, slope, small stones.
EeB:				
Edgemont	Fair: depth to rock.	Probable	Probable	Poor: area reclaim, small stones.
EeD:				
Edgemont	Fair: slope, depth to rock.	Probable	Probable	Poor: area reclaim, slope, small stones.
EeF:				
Edgemont	Poor: slope.	Probable	Probable	Poor: area reclaim, slope, small stones.
EkA:				
Elk	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
EkB:				
Elk	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
GbB:				
Glenelg	Fair: large stones.	Probable	Probable	Poor: area reclaim, small stones.
GbC:				
Glenelg	Fair: large stones.	Probable	Probable	Poor: area reclaim, small stones.
GbD:				
Glenelg	Fair: large stones, slope.	Probable	Probable	Poor: area reclaim, slope, small stones.
GdA:				
Glenville	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, wetness.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
GdB:				
Glenville	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, wetness.
HaA:				
Hagerstown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
HaB:				
Hagerstown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
HaC:				
Hagerstown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Hc:				
Hatboro	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
HgB:				
Highfield	Fair: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
HgC:				
Highfield	Fair: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
HHD:				
Highfield	Fair: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
Catoctin	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
HKD:				
Highfield	Fair: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
Catoctin	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Myersville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
KnD:				
Klinesville	Poor: depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: slope, small stones, depth to rock.
KnE:				
Klinesville	Poor: slope, depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: slope, small stones, depth to rock.
Lc:				
Lamington	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, wetness.
LeB:				
Lansdale	Fair: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
LfC:				
Lansdale	Fair: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
LgB:				
Legore	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
LgC:				
Legore	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
LgD:				
Legore	Fair: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
LhA:				
Lehigh	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, wetness.
LhB:				
Lehigh	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, wetness.
LhC:				
Lehigh	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, wetness.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
LhD:				
Lehigh	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, wetness.
LkB:				
Lehigh	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, wetness.
LrB:				
Lewisberry	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
LrC:				
Lewisberry	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
LSD:				
Lewisberry	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
Lansdale	Fair: slope, thin layer, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
Lw:				
Lindside	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey.
MdA:				
Mount Lucas	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, wetness.
MdB:				
Mount Lucas	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, wetness.
MeB:				
Mount Lucas	Poor: wetness.	Probable	Probable	Poor: area reclaim, small stones, wetness.
MOB:				
Mt. Airy	Poor: depth to rock.	Improbable: small stones	Improbable: thin layer.	Poor: small stones.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
MOB:				
Manor	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
MOC:				
Mt. Airy	Poor: depth to rock.	Improbable: small stones	Improbable: thin layer.	Poor: small stones.
Manor	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
MOD:				
Mt. Airy	Poor: depth to rock.	Improbable: small stones	Improbable: thin layer.	Poor: slope, small stones.
Manor	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
MOE:				
Mt. Airy	Poor: slope, depth to rock.	Improbable: small stones	Improbable: thin layer.	Poor: slope, small stones.
Manor	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
MPD:				
Mt. Airy	Poor: depth to rock.	Improbable: small stones	Improbable: thin layer.	Poor: slope, small stones.
Manor	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
MRF:				
Mt. Airy	Poor: slope, depth to rock.	Improbable: small stones	Improbable: thin layer.	Poor: slope, small stones.
Manor	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
MvB:				
Murrill	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
MvC:				
Murrill	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
NaB:				
Neshaminy	Fair: thin layer, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
NaC:				
Neshaminy	Fair: thin layer, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
NdB:				
Neshaminy	Fair: thin layer, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
NdD:				
Neshaminy	Fair: slope, thin layer, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
NdE:				
Neshaminy	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
Pa:				
Penlaw	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
PbB:				
Penn	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
PbD:				
Penn	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
PcF:				
Penn	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
PeB:				
Penn	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
PeC:				
Penn	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
PoB:				
Penn	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Klinesville	Poor: depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: small stones, depth to rock.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
PoC:				
Penn	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Klinesville	Poor: depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: small stones, depth to rock.
PpB:				
Penn	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Lansdale	Fair: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
PpC:				
Penn	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Lansdale	Fair: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
PsB:				
Pequea	Fair: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
PsC:				
Pequea	Fair: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, small stones.
PsD:				
Pequea	Fair: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Pt*:				
Pits, quarries.				
RaA:				
Raritan	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, wetness.
RaB:				
Raritan	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, wetness.
ReA:				
Readington	Fair: thin layer, wetness, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
ReB:				
Readington	Fair: thin layer, wetness, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
RfB:				
Reaville	Poor: wetness, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, wetness.
RfC:				
Reaville	Poor: wetness, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, wetness.
Rw:				
Rowland	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
StC:				
Steinsburg	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
StD:				
Steinsburg	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Uc*:				
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
UdB*:				
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Chester	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
UeB*:				
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Conestoga	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
UfC*:				
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Mt. Airy	Poor: depth to rock.	Improbable: small stones	Improbable: thin layer.	Poor: small stones.
UgB*:				
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Penn	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
WaA:				
Watchung	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, too clayey, wetness.
WaB:				
Watchung	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, too clayey, wetness.
WbB:				
Watchung	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, too clayey, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 15.--Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil or miscellaneous area was not rated. Information in this table indicates the dominant soil condition, but does not eliminate the need for onsite investigation)

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
ArB:							
Arendtsville	Severe: seepage.	Moderate: piping, thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Favorable	Limitation: droughty.
ArC:							
Arendtsville	Severe: seepage, slope.	Moderate: piping, thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: slope.	Limitation: slope, droughty.
ArD:							
Arendtsville	Severe: seepage, slope.	Moderate: piping, thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: slope.	Limitation: slope, droughty.
AtB:							
Athol	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: rooting depth, slope.	Favorable	Limitation: rooting depth.
AtC:							
Athol	Severe: slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: rooting depth, slope.	Limitation: slope.	Limitation: rooting depth, slope.
Ba:							
Baile	Slight	Severe: piping, wetness.	Severe: slow refill.	Limitation: frost action, percs slowly.	Limitation: percs slowly, wetness.	Limitation: erodes easily, percs slowly, wetness.	Limitation: erodes easily, percs slowly, wetness.
Be:							
Bermudian	Severe: seepage.	Severe: piping.	Moderate: cutbanks cave, deep to water.	Limitation: deep to water.	Limitation: erodes easily, flooding.	Favorable	Favorable.
BgA:							
Birdsboro	Moderate: slow refill, deep to water.	Severe: piping.	Moderate: slow refill, deep to water.	Favorable	Limitation: erodes easily, wetness.	Limitation: erodes easily, wetness.	Limitation: erodes easily.
BgB:							
Birdsboro	Moderate: slow refill, deep to water.	Severe: piping.	Moderate: slow refill, deep to water.	Limitation: slope.	Limitation: erodes easily, slope, wetness.	Limitation: erodes easily, wetness.	Limitation: erodes easily.
BgC:							
Birdsboro	Severe: seepage, slope.	Severe: piping.	Moderate: slow refill, deep to water.	Limitation: slope.	Limitation: erodes easily, slope, wetness.	Limitation: erodes easily, slope, wetness.	Limitation: erodes easily, slope.

See footnote at end of table.

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Bo: Bowmansville--------	Severe: seepage.	Severe: hard to pack, piping, wetness.	Severe: slow refill, cutbanks cave.	Limitation: flooding, frost action.	Limitation: flooding, wetness.	Limitation: wetness.	Limitation: wetness.
BrB: Brecknock-----------	Moderate: seepage, slope, depth to rock.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Favorable------	Limitation: droughty.
BrC: Brecknock-----------	Severe: slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: slope.	Limitation: slope, droughty.
BrD: Brecknock-----------	Severe: slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: slope.	Limitation: slope, droughty.
BsD: Brecknock-----------	Severe: slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: slope.	Limitation: slope, droughty.
BsF: Brecknock-----------	Severe: slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: slope.	Limitation: slope, droughty.
CcC: Catoctin------------	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: large stones, depth to rock, droughty.	Limitation: large stones, slope, depth to rock.	Limitation: large stones, slope, droughty.
Cd: Chagrin--------------	Moderate: seepage.	Severe: piping.	Severe: cutbanks cave.	Limitation: deep to water.	Limitation: flooding.	Favorable------	Favorable.
CeB: Chester-------------	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Limitation: erodes easily.	Limitation: erodes easily.
CeC: Chester-------------	Severe: slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.
CkA: Clarksburg----------	Moderate: seepage.	Severe: piping.	Severe: no water.	Limitation: percs slowly.	Limitation: percs slowly, wetness.	Limitation: erodes easily, wetness.	Limitation: erodes easily, rooting depth.

See footnote at end of table.

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
CkB:							
Clarksburg----------	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Limitation: percs slowly, slope.	Limitation: percs slowly, slope, wetness.	Limitation: erodes easily, wetness.	Limitation: erodes easily, rooting depth.
Cm:							
Codorus-------------	Severe: seepage.	Severe: wetness.	Moderate: slow refill.	Limitation: flooding, frost action.	Limitation: flooding, wetness.	Limitation: wetness.	Limitation: flooding, wetness.
CnA:							
Conestoga-----------	Moderate: seepage.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Favorable------	Favorable------	Favorable.
CnB:							
Conestoga-----------	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Favorable------	Favorable.
CnC:							
Conestoga-----------	Severe: slope.	Severe: hard to pack.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Limitation: slope.	Limitation: slope.
CrA:							
Croton--------------	Moderate: depth to rock.	Severe: wetness.	Severe: no water.	Limitation: frost action, percs slowly.	Limitation: percs slowly, rooting depth, wetness.	Limitation: erodes easily, rooting depth, wetness.	Limitation: erodes easily, wetness, droughty.
CrB:							
Croton--------------	Moderate: slope, depth to rock.	Severe: wetness.	Severe: no water.	Limitation: frost action, percs slowly, slope.	Limitation: percs slowly, slope, wetness.	Limitation: erodes easily, rooting depth, wetness.	Limitation: erodes easily, wetness, droughty.
DuA:							
Duffield------------	Moderate: seepage, depth to rock.	Severe: hard to pack, piping.	Severe: no water.	Limitation: deep to water.	Limitation: erodes easily.	Limitation: erodes easily.	Limitation: erodes easily.
DuB:							
Duffield------------	Moderate: seepage, slope, depth to rock.	Severe: hard to pack, piping.	Severe: no water.	Limitation: deep to water.	Limitation: erodes easily, slope.	Limitation: erodes easily.	Limitation: erodes easily.
DuC:							
Duffield------------	Severe: slope.	Severe: hard to pack, piping.	Severe: no water.	Limitation: deep to water.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.
DWD:							
Duffield------------	Severe: slope.	Severe: hard to pack, piping.	Severe: no water.	Limitation: deep to water.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.

See footnote at end of table.

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
DWD:							
Hagerstown	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Limitation: slope.	Limitation: slope.
Dx*:							
Dumps, refuse.							
EdB:							
Edgemont	Severe: seepage.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Favorable	Limitation: droughty.
EdC:							
Edgemont	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: slope.	Limitation: slope, droughty.
EdD:							
Edgemont	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: slope.	Limitation: slope, droughty.
EeB:							
Edgemont	Severe: seepage.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: large stones.	Limitation: large stones, droughty.
EeD:							
Edgemont	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: large stones. slope.	Limitation: large stones, slope, droughty.
EeF:							
Edgemont	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: large stones. slope.	Limitation: large stones, slope, droughty.
EkA:							
Elk	Moderate: seepage.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: erodes easily.	Limitation: erodes easily.	Limitation: erodes easily.
EkB:							
Elk	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: erodes easily, slope.	Limitation: erodes easily.	Limitation: erodes easily.
GbB:							
Glenelg	Moderate: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: large stones, slope.	Limitation: erodes easily, large stones.	Limitation: erodes easily, large stones.
GbC:							
Glenelg	Severe: slope.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: large stones, slope.	Limitation: erodes easily, large stones. slope.	Limitation: erodes easily, large stones, slope.

See footnote at end of table.

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
GbD: Glenelg	Severe: slope.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: large stones, slope.	Limitation: erodes easily, large stones, slope.	Limitation: erodes easily, large stones, slope.
GdA: Glenville	Slight	Severe: piping, wetness.	Severe: no water.	Limitation: frost action, percs slowly.	Limitation: percs slowly, wetness.	Limitation: rooting depth, wetness.	Limitation: rooting depth, wetness.
GdB: Glenville	Moderate: slope.	Severe: piping, wetness.	Severe: no water.	Limitation: frost action, percs slowly, slope.	Limitation: percs slowly, slope, wetness.	Limitation: rooting depth, wetness.	Limitation: rooting depth, wetness.
HaA: Hagerstown	Moderate: seepage, depth to rock.	Moderate: hard to pack.	Severe: no water.	Limitation: deep to water.	Favorable	Favorable	Favorable.
HaB: Hagerstown	Moderate: seepage, slope, depth to rock.	Moderate: hard to pack.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Favorable	Favorable.
HaC: Hagerstown	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Limitation: slope.	Limitation: slope.
Hc: Hatboro	Severe: seepage.	Severe: piping, wetness.	Slight	Limitation: flooding, frost action.	Limitation: flooding, wetness.	Limitation: wetness.	Limitation: wetness.
HgB: Highfield	Moderate: seepage, slope, depth to rock.	Severe: thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Favorable	Favorable.
HgC: Highfield	Severe: slope.	Severe: thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: slope.	Limitation: slope.
HHD: Highfield	Severe: slope.	Severe: thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: slope.	Limitation: slope.
Catoctin	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: large stones, depth to rock, droughty.	Limitation: large stones, slope, depth to rock.	Limitation: large stones, slope, droughty.

See footnote at end of table.

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
HKD:							
Highfield-----------	Severe: slope.	Moderate: piping, thin layer.	Moderate: slow refill, deep to water, depth to rock.	Limitation: deep to water.	Limitation: slope.	Limitation: slope.	Limitation: slope.
Catoctin------------	Severe: seepage, slope.	Severe: large stones.	Severe: no water.	Limitation: deep to water.	Limitation: large stones, slope, droughty.	Limitation: large stones, slope, depth to rock.	Limitation: large stones, slope, droughty.
Myersville----------	Severe: slope.	Moderate: large stones, piping, thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Limitation: large stones, slope.	Limitation: large stones, slope.
KnD:							
Klinesville---------	Severe: slope, depth to rock.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock, droughty.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock, droughty.
KnE:							
Klinesville---------	Severe: slope, depth to rock.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock, droughty.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock, droughty.
Lc:							
Lamington-----------	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill.	Limitation: frost action, percs slowly,	Limitation: percs slowly, rooting depth, wetness.	Limitation: erodes easily, large stones, wetness.	Limitation: erodes easily, large stones, wetness.
LeB:							
Lansdale------------	Severe: seepage.	Severe: thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Favorable------	Limitation: droughty.
LfC:							
Lansdale------------	Severe: seepage.	Severe: thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Favorable------	Limitation: droughty.
LgB:							
Legore--------------	Severe: seepage.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Favorable------	Favorable.
LgC:							
Legore--------------	Severe: seepage.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Favorable------	Limitation: droughty.
LgD:							
Legore--------------	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: slope.	Limitation: slope, droughty.

See footnote at end of table.

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
LhA:							
Lehigh	Moderate: depth to rock.	Severe: piping, wetness.	Severe: no water.	Limitation: frost action, percs slowly.	Limitation: percs slowly, wetness.	Limitation: wetness.	Limitation: wetness.
LhB:							
Lehigh	Moderate: slope, depth to rock.	Severe: piping, wetness.	Severe: no water.	Limitation: frost action, percs slowly, slope.	Limitation: percs slowly, slope, wetness.	Limitation: wetness.	Limitation: wetness.
LhC:							
Lehigh	Severe: slope.	Severe: piping, wetness.	Severe: no water.	Limitation: frost action, percs slowly, slope.	Limitation: percs slowly, slope, wetness.	Limitation: slope, wetness.	Limitation: erodes easily, large stones, slope.
LhD:							
Lehigh	Severe: slope.	Severe: piping, wetness.	Severe: no water.	Limitation: frost action, percs slowly, slope.	Limitation: percs slowly, slope, wetness.	Limitation: slope, wetness.	Limitation: slope, wetness.
LkB:							
Lehigh	Moderate: slope, depth to rock.	Severe: piping, wetness.	Severe: no water.	Limitation: frost action, percs slowly, slope.	Limitation: percs slowly, slope, wetness.	Limitation: percs slowly, wetness.	Limitation: percs slowly, wetness.
LrB:							
Lewisberry	Severe: seepage.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Favorable	Favorable.
LrC:							
Lewisberry	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Limitation: slope.	Limitation: slope.
LSD:							
Lewisberry	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Limitation: slope.	Limitation: slope.
Lansdale	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: large stones, slope.	Limitation: large stones, slope, droughty.
Lw:							
Lindside	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill.	Limitation: flooding, frost action.	Limitation: flooding, wetness.	Limitation: erodes easily, wetness.	Limitation: erodes easily.
MdA:							
Mount Lucas	Severe: seepage.	Severe: piping, wetness.	Severe: no water.	Limitation: frost action, percs slowly.	Limitation: percs slowly, wetness.	Limitation: percs slowly, wetness.	Limitation: percs slowly, wetness.

See footnote at end of table.

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
MdB:							
Mount Lucas	Severe: seepage.	Severe: piping, wetness.	Severe: no water.	Limitation: frost action, percs slowly, slope.	Limitation: percs slowly, slope, wetness.	Limitation: percs slowly, wetness.	Limitation: percs slowly, wetness.
MeB:							
Mount Lucas	Severe: seepage.	Severe: piping, wetness.	Severe: no water.	Limitation: frost action, percs slowly, slope.	Limitation: percs slowly, slope, wetness.	Limitation: percs slowly, wetness.	Limitation: percs slowly, wetness.
MOB:							
Mt. Airy	Severe: seepage.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock, droughty.	Limitation: depth to rock.	Limitation: depth to rock, droughty.
Manor	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: erodes easily, slope.	Limitation: erodes easily.	Limitation: erodes easily.
MOC:							
Mt. Airy	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock, droughty.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock, droughty.
Manor	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.
MOD:							
Mt. Airy	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock, droughty.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock, droughty.
Manor	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.
MOE:							
Mt. Airy	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock, droughty.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock, droughty.
Manor	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.
MPD:							
Mt. Airy	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock, droughty.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock, droughty.

See footnote at end of table.

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
MPD:							
Manor	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Limitation: slope.	Limitation: slope.
MRF:							
Mt. Airy	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock, droughty.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock, droughty.
Manor	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Limitation: slope.	Limitation: slope.
MvB:							
Murrill	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Favorable	Favorable.
MvC:							
Murrill	Severe: slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Limitation: slope.	Limitation: slope.
NaB:							
Neshaminy	Moderate: slope, depth to rock.	Severe: hard to pack, piping.	Severe: no water.	Limitation: deep to water.	Limitation: large stones, slope.	Limitation: large stones.	Limitation: large stones.
NaC:							
Neshaminy	Severe: slope.	Severe: hard to pack, piping.	Severe: no water.	Limitation: deep to water.	Limitation: large stones, slope.	Limitation: large stones, slope.	Limitation: large stones, slope.
NdB:							
Neshaminy	Moderate: slope, depth to rock.	Severe: hard to pack, piping.	Severe: no water.	Limitation: deep to water.	Limitation: large stones, slope.	Limitation: large stones.	Limitation: large stones.
NdD:							
Neshaminy	Severe: slope.	Severe: hard to pack, piping.	Severe: no water.	Limitation: deep to water.	Limitation: large stones, slope.	Limitation: large stones, slope.	Limitation: large stones, slope.
NdE:							
Neshaminy	Severe: slope.	Severe: hard to pack, piping.	Severe: no water.	Limitation: deep to water.	Limitation: large stones, slope.	Limitation: large stones, slope.	Limitation: large stones, slope.
Pa:							
Penlaw	Moderate: seepage, depth to rock.	Severe: piping, wetness.	Severe: no water.	Limitation: frost action, percs slowly.	Limitation: percs slowly, wetness.	Limitation: erodes easily, wetness.	Limitation: erodes easily, wetness.
PbB:							
Penn	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock.	Limitation: depth to rock.	Limitation: depth to rock.

See footnote at end of table.

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
PbD:							
Penn	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock.
PcF:							
Penn	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock.
PeB:							
Penn	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock.	Limitation: depth to rock.	Limitation: depth to rock.
PeC:							
Penn	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock.
PoB:							
Penn	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock.	Limitation: depth to rock.	Limitation: depth to rock.
Klinesville	Severe: depth to rock.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock, droughty.	Limitation: depth to rock.	Limitation: depth to rock, droughty.
PoC:							
Penn	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock.
Klinesville	Severe: slope, depth to rock.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock, droughty.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock, droughty.
PpB:							
Penn	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock.	Limitation: depth to rock.	Limitation: depth to rock.
Lansdale	Severe: seepage.	Severe: thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Favorable	Limitation: droughty.
PpC:							
Penn	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock.
Lansdale	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Limitation: deep to water.	Limitation: slope, droughty.	Limitation: slope.	Limitation: slope, droughty.

See footnote at end of table.

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
PsB:							
Pequea	Severe: seepage.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: erodes easily, slope.	Limitation: erodes easily.	Limitation: erodes easily.
PsC:							
Pequea	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.
PsD:							
Pequea	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.	Limitation: erodes easily, slope.
Pt*:							
Pits, quarries.							
RaA:							
Raritan	Severe: seepage.	Severe: piping, wetness.	Severe: no water.	Limitation: frost action.	Limitation: rooting depth, wetness.	Limitation: erodes easily, wetness.	Limitation: erodes easily, wetness.
RaB:							
Raritan	Severe: seepage.	Severe: piping, wetness.	Severe: no water.	Limitation: frost action, slope.	Limitation: rooting depth, slope, wetness.	Limitation: erodes easily, wetness.	Limitation: erodes easily, wetness.
ReA:							
Readington	Moderate: seepage, depth to rock.	Severe: piping.	Severe: no water.	Favorable	Limitation: wetness, droughty.	Limitation: erodes easily, wetness.	Limitation: erodes easily, droughty.
ReB:							
Readington	Moderate: seepage, slope, depth to rock.	Severe: piping.	Severe: no water.	Limitation: slope.	Limitation: slope, wetness, droughty.	Limitation: erodes easily, wetness.	Limitation: erodes easily, droughty.
RfB:							
Reaville	Moderate: slope, depth to rock.	Severe: piping, wetness.	Severe: slow refill, depth to rock.	Limitation: large stones, percs slowly, depth to rock.	Limitation: slope, wetness, droughty.	Limitation: large stones, depth to rock.	Limitation: large stones, wetness.
RfC:							
Reaville	Severe: slope.	Severe: piping, wetness.	Severe: slow refill, depth to rock.	Limitation: large stones, percs slowly, depth to rock.	Limitation: slope, wetness, droughty.	Limitation: large stones, slope, depth to rock.	Limitation: large stones, slope, wetness.
Rw:							
Rowland	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Limitation: flooding, frost action.	Limitation: erodes easily, flooding, wetness.	Limitation: erodes easily, wetness.	Limitation: erodes easily, wetness.

See footnote at end of table.

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
StC:							
Steinsburg	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: large stones, slope, droughty.	Limitation: large stones, slope, depth to rock.	Limitation: large stones, slope, droughty.
StD:							
Steinsburg	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: large stones, slope, droughty.	Limitation: large stones, slope, depth to rock.	Limitation: large stones, slope, droughty.
Uc*:							
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
UdB*:							
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Chester	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Limitation: erodes easily.	Limitation: erodes easily.
UeB*:							
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Conestoga	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Limitation: deep to water.	Limitation: slope.	Favorable	Favorable.
UfC*:							
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Mt. Airy	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock, droughty.	Limitation: slope, depth to rock.	Limitation: slope, depth to rock, droughty.
UgB*:							
Urban land	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.	Limitation: variable.
Penn	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Limitation: deep to water.	Limitation: slope, depth to rock.	Limitation: depth to rock.	Limitation: depth to rock.
WaA:							
Watchung	Moderate: seepage.	Severe: hard to pack, wetness.	Severe: slow refill.	Limitation: frost action, percs slowly.	Limitation: percs slowly, wetness.	Limitation: erodes easily, percs slowly, wetness.	Limitation: erodes easily, percs slowly, wetness.

See footnote at end of table.

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
WaB:							
Watchung	Moderate: seepage, slope.	Severe: hard to pack, wetness.	Severe: slow refill.	Limitation: frost action, percs slowly, slope.	Limitation: percs slowly, slope, wetness.	Limitation: erodes easily, percs slowly, wetness.	Limitation: erodes easily, percs slowly, wetness.
WbB:							
Watchung	Moderate: seepage.	Severe: hard to pack, wetness.	Severe: slow refill.	Limitation: frost action, percs slowly.	Limitation: large stones, wetness.	Limitation: erodes easily, large stones, wetness.	Limitation: erodes easily, large stones, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 16.--Engineering Index Properties

(Absence of an entry indicates that the data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
ArB:												
Arendtsville----	0-9	Gravelly loam--	GC, GM, ML	A-4, A-6	0	0-5	65-85	50-70	45-65	40-55	25-35	NP-10
	9-53	Gravelly sandy loam, clay loam, gravelly loam.	CL, SC, GC	A-4, A-6	0	0-5	55-100	50-85	45-85	40-65	25-38	8-16
	53-68	Gravelly loam, very gravelly sandy loam, very gravelly loam.	GM, ML, SM	A-2, A-1, A-4, A-6	0-1	0-30	25-90	20-85	20-85	15-60	23-39	1-12
ArC:												
Arendtsville----	0-9	Gravelly loam--	GC, GM, ML	A-4, A-6	0	0-5	65-85	50-70	45-65	40-55	25-35	NP-10
	9-53	Gravelly sandy loam, clay loam, gravelly loam.	CL, SC, GC	A-4, A-6	0	0-5	55-100	50-85	45-85	40-65	25-38	8-16
	53-68	Gravelly loam, very gravelly sandy loam, very gravelly loam.	ML, GM, SM	A-1, A-2, A-6, A-4	0-1	0-30	25-90	20-85	20-85	15-60	23-39	1-12
ArD:												
Arendtsville----	0-9	Gravelly loam--	GC, GM, ML	A-4, A-6	0	0-5	65-85	50-70	45-65	40-55	25-35	NP-10
	9-53	Gravelly sandy loam, clay loam, gravelly loam.	CL, SC, GC	A-4, A-6	0	0-5	55-100	50-85	45-85	40-65	25-38	8-16
	53-68	Gravelly loam, very gravelly sandy loam, very gravelly loam.	ML, GM, SM	A-1, A-2, A-6, A-4	0-1	0-30	25-90	20-85	20-85	15-60	23-39	1-12
AtB:												
Athol-----------	0-10	Gravelly silt loam.	CL-ML, ML	A-4	0	0-5	90-100	75-95	65-90	50-75	20-35	1-10
	10-52	Silt loam, gravelly silty clay loam, gravelly clay loam.	ML	A-4	0	0-5	90-100	75-95	65-90	50-75	25-40	2-10
	52-60	Loam, gravelly silt loam, gravelly silty clay loam.	ML, SM	A-2, A-4	0	0-5	90-100	65-85	60-80	30-65	20-40	NP-10

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
AtC:												
Athol-----------	0-10	Gravelly silt loam.	CL-ML, ML	A-4	0	0-5	90-100	75-95	65-90	50-75	20-35	1-10
	10-52	Silt loam, gravelly silty clay loam, gravelly clay loam.	ML	A-4	0	0-5	90-100	75-95	65-90	50-75	25-40	2-10
	52-60	Loam, gravelly silt loam, gravelly silty clay loam.	ML, SM	A-2, A-4	0	0-5	90-100	65-85	60-80	30-65	20-40	NP-10
Ba:												
Baile-----------	0-12	Silt loam------	MH, ML	A-6, A-4, A-7	---	0-10	85-100	80-100	70-100	50-95	33-67	7-24
	12-44	Silty clay loam, silt loam, clay loam.	CL	A-6	0	0	90-100	80-100	70-100	55-95	28-34	11-14
	44-60	Loam, sandy loam, silt loam.	ML, SC, CL, SM	A-2, A-4, A-6	0	0	80-100	80-100	50-100	25-90	0-35	NP-11
Be:												
Bermudian-------	0-8	Silt loam------	ML	A-4	0	0	90-100	90-100	70-90	60-80	0-14	---
	8-50	Silt loam, gravelly silty clay loam, channery sandy clay loam.	ML, SC, SM	A-4, A-6, A-7-6	---	0-10	65-90	60-80	55-75	40-60	30-45	8-15
	50-60	Stratified sand to gravelly sandy clay loam.	CL-ML, SM, GM, ML	A-1, A-2, A-4	---	0-15	40-95	25-90	20-80	20-65	0-20	NP-5
BgA:												
Birdsboro-------	0-10	Silt loam------	CL, ML, CL-ML	A-4	0	0	95-100	85-100	80-100	65-90	20-35	2-10
	10-60	Silt loam, sandy clay loam, gravelly clay loam.	GM, ML, CL, SM	A-4, A-6	0	0-5	70-100	65-100	60-100	45-95	25-35	3-11
BgB:												
Birdsboro-------	0-10	Silt loam------	CL, CL-ML, ML	A-4	0	0	95-100	85-100	80-100	65-90	20-35	2-10
	10-60	Silt loam, sandy clay loam, gravelly clay loam.	CL, SM, GM, ML	A-4, A-6	0	0-5	70-100	65-100	60-100	45-95	25-35	3-11
BgC:												
Birdsboro-------	0-10	Silt loam------	CL, CL-ML, ML	A-4	0	0	95-100	85-100	80-100	65-90	20-35	2-10
	10-60	Silt loam, sandy clay loam, gravelly clay loam.	CL, SM, GM, ML	A-4, A-6	0	0-5	70-100	65-100	60-100	45-95	25-35	3-11

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
Bo:												
Bowmansville----	0-11	Silt loam------	ML, SM	A-4	0	0-5	95-100	80-100	60-100	35-90	0-14	NP
	11-34	Silt loam, silty clay loam, sandy clay loam.	CL, ML, SM, SC	A-6, A-4, A-7	0	0-5	95-100	80-100	80-100	40-90	30-45	8-15
	34-60	Silty clay loam, sandy loam, gravelly silt loam.	CL, MH, SM, ML	A-6, A-7	0	0-10	90-100	65-100	60-100	35-100	35-55	15-25
BrB:												
Brecknock-------	0-7	Channery silt loam.	GC, CL, GM, ML	A-4, A-6	0	0-10	65-80	60-70	50-65	40-65	0-14	---
	7-30	Silt loam, clay loam, channery silt loam.	ML, GM, SM	A-2, A-4, A-6	0	0-15	65-100	50-95	40-85	30-85	25-40	NP-13
	30-42	Channery silt loam, channery loam, very channery clay loam.	GP-GM, GM, ML, SM	A-2, A-1, A-4, A-6	0	0-20	20-90	15-90	10-85	10-75	25-40	NP-12
	42-52	Weathered bedrock.			---	---	---	---	---	---	---	---
BrC:												
Brecknock-------	0-7	Channery silt loam.	GC, GM, CL, ML	A-4, A-6	0	0-10	65-80	60-70	50-65	40-65	0-14	---
	7-30	Silt loam, clay loam, channery silt loam.	GM, ML, SM	A-2, A-6, A-4	0	0-15	65-100	50-95	40-85	30-85	25-40	NP-13
	30-42	Channery silt loam, channery loam, very channery clay loam.	GM, SM, GP-GM, ML	A-1, A-6, A-2, A-4	0	0-20	20-90	15-90	10-85	10-75	25-40	NP-12
	42-52	Weathered bedrock.			---	---	---	---	---	---	---	---
BrD:												
Brecknock-------	0-7	Channery silt loam.	CL, ML, GC, GM	A-4, A-6	0	0-10	65-80	60-70	50-65	40-65	0-14	---
	7-30	Silt loam, clay loam, channery silt loam.	GM, ML, SM	A-4, A-2, A-6	0	0-15	65-100	50-95	40-85	30-85	25-40	NP-13
	30-42	Channery silt loam, channery loam, very channery clay loam.	GM, SM, GP-GM, ML	A-2, A-4, A-1, A-6	0	0-20	20-90	15-90	10-85	10-75	25-40	NP-12
	42-52	Weathered bedrock.			---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
BsD:												
Brecknock-------	0-7	Very stony silt loam.	CL, ML, GC, GM	A-4, A-6	1-5	3-10	65-100	50-100	45-95	40-85	0-14	---
	7-30	Silt loam, clay loam, channery silt loam.	GM, ML, SM	A-2, A-6, A-4	0-1	0-15	65-100	50-95	40-85	30-85	25-40	NP-13
	30-42	Channery silt loam, channery loam, very channery clay loam.	GM, SM, GP-GM, ML	A-2, A-1, A-4, A-6	0-1	0-20	20-90	15-90	10-85	10-75	25-40	NP-12
	42-52	Weathered bedrock.			---	---	---	---	---	---	---	---
BsF:												
Brecknock-------	0-7	Very stony silt loam.	GC, CL, GM, ML	A-4, A-6	1-5	3-10	65-100	50-100	45-95	40-85	0-14	---
	7-30	Silt loam, clay loam, channery silt loam.	GM, ML, SM	A-2, A-4, A-6	0-1	0-15	65-100	50-95	40-85	30-85	25-40	NP-13
	30-42	Channery silt loam, channery loam, very channery clay loam.	GP-GM, GM, ML, SM	A-2, A-4, A-1, A-6	0-1	0-20	20-90	15-90	10-85	10-75	25-40	NP-12
	42-52	Weathered bedrock.			---	---	---	---	---	---	---	---
CcC:												
Catoctin--------	0-9	Channery silt loam.	CL, SM, GM, ML	A-2, A-4	0	0-25	50-80	35-75	30-65	25-60	0-30	NP-8
	9-16	Channery silt loam, channery silty clay loam.	GM, CL, SC, SM	A-2, A-6, A-4	0	0-25	50-80	35-75	30-60	25-60	20-34	2-12
	16-24	Very channery silt loam, channery silt loam.	GC, SM, GM, SC	A-2, A-1, A-3, A-4	0-1	10-40	30-75	10-60	9-55	7-50	0-28	NP-8
	24-34	Weathered bedrock.			---	---	---	---	---	---	---	---
Cd:												
Chagrin---------	0-10	Silt loam.	CL, ML, CL-ML	A-4	0	0	95-100	85-100	80-100	70-90	20-35	2-10
	10-36	Silt loam, loam, sandy loam.	ML, SM	A-2, A-4, A-6	0	0	90-100	75-100	55-90	30-80	20-40	NP-14
	36-60	Stratified silt loam to gravelly fine sand.	ML, SP-SM, SM	A-2, A-4	0	0	75-100	65-100	40-85	10-80	20-40	NP-10
CeB:												
Chester---------	0-11	Silt loam------	CL, CL-ML	A-4	0	0-10	85-100	80-100	70-100	50-90	22-27	5-10
	11-36	Silty clay loam, silt loam, clay loam.	CL, ML	A-4, A-6, A-7	0	0-10	85-100	80-100	70-100	55-95	30-50	8-17
	36-60	Silt loam, loam, sandy loam.	ML, SM	A-4, A-2, A-7	0	0-10	80-100	80-100	60-100	30-90	0-47	4-12

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
CeC:												
Chester---------	0-11	Silt loam------	CL, CL-ML	A-4	0	0-10	85-100	80-100	70-100	50-90	22-27	5-10
	11-36	Silty clay loam, silt loam, clay loam.	CL, ML	A-4, A-6, A-7	0	0-10	85-100	80-100	70-100	55-95	30-50	8-17
	36-60	Silt loam, loam, sandy loam.	ML, SM	A-4, A-2, A-7	0	0-10	80-100	80-100	60-100	30-90	0-47	4-12
CkA:												
Clarksburg------	0-8	Silt loam------	CL, ML	A-4, A-6	0	0-5	90-100	85-100	80-95	75-90	25-35	2-11
	8-32	Loam, channery silty clay loam, gravelly silt loam.	CL, CL-ML, ML	A-4, A-7, A-6	0	0-10	80-100	65-100	60-95	55-85	25-45	6-20
	32-54	Silty clay loam, channery loam, gravelly silt loam.	CL, SC-SM, CL-ML, SC	A-6, A-4, A-7	0	0-15	75-100	55-100	50-95	45-90	20-45	4-20
	54-64	Clay, channery loam, silty clay loam.	CL, GC, CH, SC-SM	A-4, A-6, A-2, A-7	0	0-20	50-100	20-100	15-95	15-90	20-52	4-25
CkB:												
Clarksburg------	0-8	Silt loam------	CL, ML	A-4, A-6	0	0-5	90-100	85-100	80-95	75-90	25-35	2-11
	8-32	Loam, channery silty clay loam, gravelly silt loam.	CL, ML, CL-ML	A-4, A-7, A-6	0	0-10	80-100	65-100	60-95	55-85	25-45	6-20
	32-54	Silty clay loam, channery loam, gravelly silt loam.	CL-ML, CL, SC, SC-SM	A-4, A-6, A-7	0	0-15	75-100	55-100	50-95	45-90	20-45	4-20
	54-64	Clay, channery loam, silty clay loam.	CL, CH, GC, SC-SM	A-2, A-4, A-7, A-6	0	0-20	50-100	20-100	15-95	15-90	20-52	4-25
Cm:												
Codorus---------	0-12	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	80-100	70-100	65-100	55-95	22-35	2-12
	12-48	Silt loam, loam, silty clay loam.	CL, ML, CL-ML	A-4, A-6	0	0	80-100	75-100	65-100	55-85	22-35	2-12
	48-60	Stratified sand to silt.	GM, SM, ML	A-1, A-2, A-4	0	0	25-100	20-100	20-85	15-65	0-35	NP-7
CnA:												
Conestoga-------	0-9	Silt loam------	ML	A-4	0	0	90-100	90-100	75-90	55-75	20-30	NP-6
	9-40	Loam, silt loam, silty clay loam.	ML	A-4, A-6, A-7	0	0	80-100	80-100	65-95	50-70	30-45	3-12
	40-60	Silt loam, channery sandy loam, channery loam.	ML, SM	A-2, A-4	---	0-5	80-100	50-100	45-95	30-55	20-35	NP-8

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
CnB:												
Conestoga-------	0-9	Silt loam------	ML	A-4	---	0-5	90-100	85-100	80-100	70-90	20-30	NP-6
	9-40	Silt loam, silty clay loam, channery silt loam.	CH, CL, MH	A-6, A-7	---	0-10	70-100	65-100	60-100	55-95	35-60	14-30
	40-60	Channery silt loam, channery loam, channery sandy loam.	GM, SM, MH, ML	A-2, A-7, A-6	---	0-15	35-90	35-85	30-80	25-75	35-60	10-25
CnC:												
Conestoga-------	0-9	Silt loam------	ML	A-4	---	0-5	90-100	85-100	80-100	70-90	20-30	NP-6
	9-40	Silt loam, silty clay loam, channery silt loam.	CH, CL, MH	A-6, A-7	---	0-10	70-100	65-100	60-100	55-95	35-60	14-30
	40-60	Channery silt loam, channery loam, channery sandy loam.	GM, SM, MH, ML	A-2, A-7, A-6	---	0-15	35-90	35-85	30-80	25-75	35-60	10-25
CrA:												
Croton----------	0-12	Silt loam------	CL, CL-ML	A-4, A-6	0	0-1	90-100	90-100	85-95	75-90	25-40	5-15
	12-20	Silt loam, silty clay loam, channery silt loam.	CL	A-6	0	0-10	90-100	85-95	80-90	70-85	30-40	10-15
	20-37	Silt loam, silty clay loam, channery silt loam.	CL	A-6	0	0-10	90-100	85-95	80-90	70-85	30-40	10-15
	37-42	Channery silt loam, channery silty clay loam, channery clay loam.	CL	A-6	0	0-10	75-95	65-80	60-75	50-70	30-40	10-15
	42-52	Unweathered bedrock.			---	---	---	---	---	---	---	---
CrB:												
Croton----------	0-12	Silt loam------	CL, CL-ML	A-4, A-6	0	0-1	90-100	90-100	85-95	75-90	25-40	5-15
	12-20	Silt loam, silty clay loam, channery silt loam.	CL	A-6	0	0-10	90-100	85-95	80-90	70-85	30-40	10-15
	20-37	Silt loam, silty clay loam, channery silt loam.	CL	A-6	0	0-10	90-100	85-95	80-90	70-85	30-40	10-15
	37-42	Channery silt loam, channery silty clay loam, channery clay loam.	CL	A-6	0	0-10	75-95	65-80	60-75	50-70	30-40	10-15
	42-52	Unweathered bedrock.			---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
DuA:												
Duffield--------	0-10	Silt loam------	CL, ML, CL-ML	A-4, A-7, A-6	0	0	85-100	85-100	80-100	70-95	20-50	5-20
	10-50	Silty clay loam, silty clay, channery loam.	CL, CH, MH, ML	A-6, A-4, A-7	0	0-10	65-100	60-100	55-100	55-95	30-55	8-22
	50-60	Channery silt loam, loam, clay.	MH, GM, ML, SM	A-5, A-7	0	0-20	65-100	50-100	45-90	40-90	40-60	9-29
DuB:												
Duffield--------	0-10	Silt loam------	CL, CL-ML, ML	A-4, A-7, A-6	0	0	85-100	85-100	80-100	70-95	20-50	5-20
	10-50	Silty clay loam, silty clay, channery loam.	CH, ML, CL, MH	A-4, A-6, A-7	0	0-10	65-100	60-100	55-100	55-95	30-55	8-22
	50-60	Channery silt loam, loam, clay.	GM, SM, MH, ML	A-5, A-7	0	0-20	65-100	50-100	45-90	40-90	40-60	9-29
DuC:												
Duffield--------	0-10	Silt loam------	CL, CL-ML, ML	A-4, A-7, A-6	0	0	85-100	85-100	80-100	70-95	20-50	5-20
	10-50	Silty clay loam, silty clay, channery loam.	CH, ML, CL, MH	A-4, A-6, A-7	0	0-10	65-100	60-100	55-100	55-95	30-55	8-22
	50-60	Channery silt loam, loam, clay.	MH, ML, GM, SM	A-5, A-7	0	0-20	65-100	50-100	45-90	40-90	40-60	9-29
DWD:												
Duffield--------	0-10	Silt loam------	CL, CL-ML, ML	A-4, A-7, A-6	0	0	85-100	85-100	80-100	70-95	20-50	5-20
	10-50	Silty clay loam, silty clay, channery loam.	CH, ML, CL, MH	A-6, A-4, A-7	0	0-10	65-100	60-100	55-100	55-95	30-55	8-22
	50-60	Channery silt loam, loam, clay.	GM, MH, SM, ML	A-5, A-7	0	0-20	65-100	50-100	45-90	40-90	40-60	9-29
Hagerstown------	0-10	Silt loam------	CL, CL-ML	A-4, A-7, A-6	0	0-15	85-100	80-100	80-100	70-95	25-50	5-25
	10-18	Clay, clay loam, loam.	CH, CL	A-7	0	0-5	90-100	80-100	75-100	55-95	48-65	26-34
	18-62	Clay, silty clay, silty clay loam.	CH, CL	A-6, A-7	0-1	0-5	85-100	80-100	75-100	75-95	30-70	15-40
Dx:												
Dumps, refuse.												

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
EdB:												
Edgemont--------	0-8	Channery loam--	GM, ML, SM	A-2, A-4	0	0-10	55-90	50-70	35-60	15-55	0-14	---
	8-30	Fine sandy loam, channery sandy clay loam, gravelly clay loam.	GM, SP-SM, GP-GM, SM	A-1, A-2, A-4	0	0-15	55-95	50-90	30-65	10-40	0-31	NP-8
	30-60	Sandy loam, channery loamy sand, very gravelly clay loam.	GP-GM, GM, SM, SP-SM	A-2, A-1, A-3, A-4	0	5-25	35-75	10-70	10-65	5-45	0-31	NP-6
EdC:												
Edgemont--------	0-8	Channery loam--	GM, ML, SM	A-2, A-4	0	0-10	55-90	50-70	35-60	15-55	0-14	---
	8-30	Fine sandy loam, channery sandy clay loam, gravelly clay loam.	GP-GM, GM, SM, SP-SM	A-1, A-2, A-4	0	0-15	55-95	50-90	30-65	10-40	0-31	NP-8
	30-60	Sandy loam, channery loamy sand, very gravelly clay loam.	GP-GM, SM, GM, SP-SM	A-2, A-3, A-1, A-4	0	5-25	35-75	10-70	10-65	5-45	0-31	NP-6
EdD:												
Edgemont--------	0-8	Channery loam--	GM, ML, SM	A-2, A-4	0	0-10	55-90	50-70	35-60	15-55	0-14	---
	8-30	Fine sandy loam, channery sandy clay loam, gravelly clay loam.	GM, SP-SM, GP-GM, SM	A-1, A-4, A-2	0	0-15	55-95	50-90	30-65	10-40	0-31	NP-8
	30-60	Sandy loam, channery loamy sand, very gravelly clay loam.	GM, SP-SM, GP-GM, SM	A-2, A-3, A-1, A-4	0	5-25	35-75	10-70	10-65	5-45	0-31	NP-6
EeB:												
Edgemont--------	0-8	Very stony loam	GM, ML, SM	A-2, A-4	1-5	3-15	55-100	50-95	35-90	15-80	0-14	---
	8-30	Fine sandy loam, channery sandy clay loam, gravelly clay loam.	GM, SP-SM, GP-GM, SM	A-1, A-4, A-2	0-3	0-15	55-95	50-90	30-65	10-40	0-31	NP-8
	30-60	Sandy loam, channery loamy sand, very gravelly clay loam.	GM, SP-SM, GP-GM, SM	A-1, A-4, A-2, A-3	1-3	5-25	35-75	10-70	10-65	5-45	0-31	NP-6

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
EeD:												
Edgemont--------	0-8	Very stony loam	GM, ML, SM	A-2, A-4	1-5	3-15	55-100	50-95	35-90	15-80	0-14	---
	8-30	Fine sandy loam, channery sandy clay loam, gravelly clay loam.	GM, SP-SM, GP-GM, SM	A-2, A-1, A-4	0-3	0-15	55-95	50-90	30-65	10-40	0-31	NP-8
	30-60	Sandy loam, channery loamy sand, very gravelly clay loam.	GP-GM, GM, SM, SP-SM	A-2, A-3, A-1, A-4	1-3	5-25	35-75	10-70	10-65	5-45	0-31	NP-6
EeF:												
Edgemont--------	0-8	Very stony loam	GM, ML, SM	A-2, A-4	1-5	3-15	55-100	50-95	35-90	15-80	0-14	---
	8-30	Fine sandy loam, channery sandy clay loam, gravelly clay loam.	GP-GM, GM, SM, SP-SM	A-1, A-4, A-2	0-3	0-15	55-95	50-90	30-65	10-40	0-31	NP-8
	30-60	Sandy loam, channery loamy sand, very gravelly clay loam.	GM, SP-SM, GP-GM, SM	A-2, A-1, A-3, A-4	1-3	5-25	35-75	10-70	10-65	5-45	0-31	NP-6
EkA:												
Elk-------------	0-10	Silt loam------	CL, CL-ML, ML	A-4	0	0	95-100	95-100	85-100	70-95	25-35	3-10
	10-48	Silty clay loam, silt loam.	CL, ML, CL-ML	A-4, A-6	0	0	95-100	90-100	85-100	75-100	25-40	5-15
	48-60	Silty clay loam, silt loam, silty clay.	CL, SC-SM, CL-ML, ML	A-4, A-6	0	0	75-100	50-100	45-100	40-95	25-40	5-15
EkB:												
Elk-------------	0-10	Silt loam------	CL, CL-ML, ML	A-4	0	0	95-100	95-100	85-100	70-95	25-35	3-10
	10-48	Silty clay loam, silt loam.	CL, CL-ML, ML	A-4, A-6	0	0	95-100	90-100	85-100	75-100	25-40	5-15
	48-60	Silty clay loam, silt loam, silty clay.	CL-ML, CL, ML, SC-SM	A-4, A-6	0	0	75-100	50-100	45-100	40-95	25-40	5-15
GbB:												
Glenelg---------	0-8	Channery silt loam.	ML, GM, SM	A-2-4, A-2-6, A-6, A-4	0	0-10	60-100	50-75	40-75	30-70	32-40	7-12
	8-29	Channery silt loam, silty clay loam, loam.	GM, ML, SM	A-4, A-7, A-6	0	0-10	60-100	50-100	45-100	35-95	34-46	9-15
	29-50	Loam, sandy loam, very channery loam.	GM, SM, ML	A-2, A-4	0-2	0-50	60-100	50-100	40-95	25-75	0-40	NP-6

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
GbC:												
Glenelg	0-8	Channery silt loam.	ML, GM, SM	A-2-6, A-4, A-2-4, A-6	0	0-10	60-100	50-75	40-75	30-70	32-40	7-12
	8-29	Channery silt loam, silty clay loam, loam.	GM, ML, SM	A-6, A-4, A-7	0	0-10	60-100	50-100	45-100	35-95	34-46	9-15
	29-50	Loam, sandy loam, very channery loam.	GM, SM, ML	A-2, A-4	0-2	0-50	60-100	50-100	40-95	25-75	0-40	NP-6
GbD:												
Glenelg	0-8	Channery silt loam.	GM, ML, SM	A-2-4, A-2-6, A-6, A-4	0	0-10	60-100	50-75	40-75	30-70	32-40	7-12
	8-29	Channery silt loam, silty clay loam, loam.	GM, ML, SM	A-6, A-4, A-7	0-1	0-10	60-100	50-100	45-100	35-95	34-46	9-15
	29-50	Loam, sandy loam, very channery loam.	GM, SM, ML	A-2, A-4	0-2	0-50	60-100	50-100	40-95	25-75	0-40	NP-6
GdA:												
Glenville	0-10	Silt loam	ML, SM	A-4	0	0	85-100	85-100	70-95	45-80	25-35	3-10
	10-19	Silt loam, channery loam, channery silty clay loam.	CL-ML, CL, GM, SC	A-4, A-6	0	0-10	70-100	60-100	60-95	45-80	25-40	5-13
	19-40	Silt loam, channery loam, silty clay loam.	CL-ML, GM, CL, SC	A-4, A-6	0	0-10	65-100	60-100	55-95	45-80	25-40	5-13
	40-60	Channery fine sandy loam, channery loam, very channery sandy loam.	GM, ML, CL-ML, SM	A-2, A-1, A-4	0	0-20	45-90	20-75	10-75	5-65	25-35	5-10
GdB:												
Glenville	0-10	Silt loam	ML, SM	A-4	0	0	85-100	85-100	70-95	45-80	25-35	3-10
	10-19	Silt loam, channery loam, channery silty clay loam.	CL-ML, GM, CL, SC	A-4, A-6	0	0-10	70-100	60-100	60-95	45-80	25-40	5-13
	19-40	Silt loam, channery loam, silty clay loam.	CL-ML, CL, GM, SC	A-4, A-6	0	0-10	65-100	60-100	55-95	45-80	25-40	5-13
	40-60	Channery fine sandy loam, channery loam, very channery sandy loam.	GM, ML, CL-ML, SM	A-1, A-2, A-4	0	0-20	45-90	20-75	10-75	5-65	25-35	5-10

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
HaA:												
Hagerstown------	0-10	Silt loam------	CL, CL-ML	A-6, A-4, A-7	0	0-15	85-100	80-100	80-100	70-95	25-50	5-25
	10-60	Clay, silty clay, silty clay loam.	CH, CL	A-6, A-7	0-1	0-5	85-100	80-100	75-100	75-95	30-70	15-40
HaB:												
Hagerstown------	0-10	Silt loam------	CL, CL-ML	A-4, A-7, A-6	0	0-15	85-100	80-100	80-100	70-95	25-50	5-25
	10-60	Clay, silty clay, silty clay loam.	CH, CL	A-6, A-7	0-1	0-5	85-100	80-100	75-100	75-95	30-70	15-40
HaC:												
Hagerstown------	0-10	Silt loam------	CL, CL-ML	A-6, A-4, A-7	0	0-15	85-100	80-100	80-100	70-95	25-50	5-25
	10-60	Clay, silty clay, silty clay loam.	CH, CL	A-6, A-7	0-1	0-5	85-100	80-100	75-100	75-95	30-70	15-40
Hc:												
Hatboro---------	0-12	Silt loam------	CL, ML	A-4, A-6	0	0	95-100	90-100	70-100	60-90	22-35	2-12
	12-45	Silt loam, silty clay loam, sandy clay loam.	CL, CL-ML, ML	A-4, A-6	0	0	85-100	80-100	70-95	55-85	22-35	2-12
	45-60	Stratified clay to gravelly sand.	GC, SM, GM, SC	A-1, A-2	0	0	50-85	45-80	45-80	15-35	0-32	NP-14
HgB:												
Highfield-------	0-12	Channery silt loam.	CL, ML, GM	A-4	0	0-10	65-85	60-75	45-65	40-55	0-14	NP
	12-38	Silt loam, channery silt loam, channery loam.	ML, GM, SM	A-4, A-6, A-7	0-1	0-10	55-85	50-80	45-70	40-55	30-49	5-19
	38-42	Channery silt loam, channery loam, very channery loam.	GM, SM	A-4, A-2, A-5, A-7	0-5	0-20	45-75	25-70	20-55	20-40	30-45	3-13
	42-52	Unweathered bedrock.			---	---	---	---	---	---	0-14	---
HgC:												
Highfield-------	0-12	Channery silt loam.	CL, GM, ML	A-4	0	0-10	65-85	60-75	45-65	40-55	0-14	NP
	12-38	Silt loam, channery silt loam, channery loam.	GM, ML, SM	A-4, A-6, A-7	0-1	0-10	55-85	50-80	45-70	40-55	30-49	5-19
	38-42	Channery silt loam, channery loam, very channery loam.	GM, SM	A-4, A-2, A-5, A-7	0-5	0-20	45-75	25-70	20-55	20-40	30-45	3-13
	42-52	Unweathered bedrock.			---	---	---	---	---	---	0-14	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
HHD:												
Highfield-------	0-12	Channery silt loam.	CL, GM, ML	A-4	0	0-10	65-85	60-75	45-65	40-55	0-14	NP
	12-38	Silt loam, channery silt loam, channery loam.	GM, SM, ML	A-4, A-6, A-7	0-1	0-10	55-85	50-80	45-70	40-55	30-49	5-19
	38-42	Channery silt loam, channery loam, very channery loam.	GM, SM	A-2, A-7, A-4, A-5	0-5	0-20	45-75	25-70	20-55	20-40	30-45	3-13
	42-52	Unweathered bedrock.			---	---	---	---	---	---	0-14	---
Catoctin--------	0-9	Channery silt loam.	GM, CL, ML, SM	A-2, A-4	---	0-25	50-80	35-75	30-65	25-60	0-30	NP-8
	9-16	Channery silt loam, channery silty clay loam.	GM, SC, CL, SM	A-2, A-6, A-4	---	0-25	50-80	35-75	30-60	25-60	20-34	2-12
	16-24	Very channery silt loam, channery silt loam.	GM, SC, GC, SM	A-1, A-2, A-4, A-3	---	10-40	30-75	10-60	9-55	7-50	0-28	NP-8
	24-34	Weathered bedrock.			---	---	---	---	---	---	---	---
HKD:												
Highfield-------	0-12	Very stony silt loam.	CL, GM, ML	A-4	---	3-15	55-100	55-100	45-95	40-95	0-14	---
	12-38	Silt loam, channery silt loam, channery loam.	ML, GM, SM	A-4, A-6, A-7	---	0-10	55-85	50-80	45-70	40-55	30-49	5-19
	38-42	Channery silt loam, channery loam, very channery silt loam.	GM, SM	A-2, A-7, A-4, A-5	---	0-20	45-75	25-70	20-55	20-40	30-45	3-13
	42-52	Unweathered bedrock.			---	---	---	---	---	---	---	---
Catoctin--------	0-9	Extremely stony silt loam.	CL, ML, CL-ML	A-4	0-5	20-50	80-90	75-85	70-80	60-70	0-30	NP-8
	9-16	Channery silt loam, channery silty clay loam, cobbly silt loam.	GM, SC, CL, SM	A-2, A-4, A-6	0-5	0-25	50-80	35-75	30-60	25-60	20-34	2-12
	16-24	Very channery silt loam, channery silt loam.	GM, SC, GC, SM	A-1, A-4, A-2, A-3	0-5	10-40	30-75	10-60	9-55	7-50	0-28	NP-8
	24-34	Unweathered bedrock.			---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
HKD:												
Myersville------	0-9	Very stony silt loam.	CL, CL-ML, ML	A-4	2-5	5-20	95-100	90-100	80-95	55-85	15-28	2-10
	9-38	Silty clay loam, clay loam, channery clay loam.	CL	A-6	0-7	3-20	75-95	70-95	55-90	50-85	28-38	12-20
	38-48	Silt loam, channery silt loam, very channery silty clay loam.	CL-ML, CL, GC, GM	A-2, A-1, A-3, A-4	0-7	3-20	30-85	20-75	12-70	8-65	0-28	NP-10
	48-60	Weathered bedrock.			---	---	---	---	---	---	---	---
	60-70	Unweathered bedrock.			---	---	---	---	---	---	---	---
KnD:												
Klinesville-----	0-8	Channery silt loam.	GM, SM	A-2, A-4	0	0-10	55-85	45-60	35-50	25-40	0-14	NP
	8-14	Channery silt loam, very channery silt loam.	GM, SP, GP, SM	A-2, A-1, A-4	0	0-10	25-75	15-55	10-50	4-40	20-35	NP-9
	14-16	Channery silt loam, very channery silt loam.	GP, GM, SM, SP	A-1, A-2	0	0-20	15-60	10-50	10-40	4-30	20-35	NP-7
	16-26	Weathered bedrock.			---	---	---	---	---	---	0-14	---
KnE:												
Klinesville-----	0-8	Channery silt loam.	GM, SM	A-2, A-4	0	0-10	55-85	45-60	35-50	25-40	0-14	NP
	8-14	Channery silt loam, very channery silt loam.	GP, GM, SM, SP	A-2, A-1, A-4	0	0-10	25-75	15-55	10-50	4-40	20-35	NP-9
	14-16	Channery silt loam, very channery silt loam.	GP, SM, GM, SP	A-1, A-2	0	0-20	15-60	10-50	10-40	4-30	20-35	NP-7
	16-26	Weathered bedrock.			---	---	---	---	---	---	0-14	---
Lc:												
Lamington-------	0-11	Silt loam------	ML	A-4	0	0	90-100	90-100	90-100	80-95	0-14	---
	11-17	Silt loam, loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0-5	90-100	80-100	75-100	70-95	20-35	5-15
	17-46	Clay loam, cobbly loam, gravelly silt loam.	CL, CL-ML	A-4, A-6	0	0-25	75-100	70-100	70-95	65-95	20-30	4-12
	46-60	Stratified gravelly silty clay loam.	GM, ML, CL-ML, SM	A-1, A-4, A-2	0-1	0-30	40-90	35-85	30-70	15-55	0-25	NP-5

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
LeB:												
Lansdale--------	0-10	Loam-----------	ML, SC-SM, CL-ML, SM	A-2, A-4	0	0-2	80-95	75-95	55-80	30-60	15-25	NP-5
	10-30	Sandy loam, sandy clay loam, channery sandy loam.	SC, SC-SM, SM	A-2	0	0-10	80-90	75-85	50-70	25-35	20-30	3-10
	30-47	Channery sandy loam, very channery sandy loam.	GM, SC, SM, SC-SM	A-1, A-2	0	0-20	55-80	50-70	30-45	15-25	20-25	3-8
	47-57	Unweathered bedrock.			---	---	---	---	---	---	---	---
LfC:												
Lansdale--------	0-10	Channery loam--	CL-ML, ML	A-4	0	0-10	80-90	75-85	65-75	50-60	15-25	NP-5
	10-30	Sandy loam, sandy clay loam, channery sandy loam.	SC, SM, SC-SM	A-2	0	0-10	80-90	75-85	50-70	25-35	20-30	3-10
	30-47	Channery sandy loam, very channery sandy loam.	GM, SM, SC, SC-SM	A-1, A-2	0	0-20	55-80	50-70	30-45	15-25	20-25	3-8
	47-57	Unweathered bedrock.			---	---	---	---	---	---	---	---
LgB:												
Legore----------	0-10	Silt loam------	CL	A-4, A-6	0	0-5	85-100	80-100	70-100	50-95	0-40	7-15
	10-30	Gravelly silty clay loam, clay loam, silty clay loam.	MH, ML, SM	A-7	0	0-15	80-100	50-100	50-100	40-95	40-65	14-30
	30-60	Gravelly silt loam, silty clay loam, sandy loam.	ML, GM, SM	A-4, A-5, A-2, A-7	0	0-15	60-100	50-100	45-100	25-95	0-50	NP-15
LgC:												
Legore----------	0-10	Gravelly silt loam.	CL, GC, SC	A-2-6, A-2-4, A-4, A-6	0	0-15	65-90	50-75	40-75	30-70	0-40	7-15
	10-30	Gravelly silty clay loam, clay loam, silty clay loam.	MH, SM, ML	A-7	0	0-15	80-100	50-100	50-100	40-95	40-65	14-30
	30-60	Gravelly silt loam, silty clay loam, sandy loam.	GM, SM, ML	A-2, A-4, A-7, A-5	0	0-15	60-100	50-100	45-100	25-95	0-50	NP-15

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
LgD:												
Legore----------	0-10	Gravelly silt loam.	CL, GC, SC	A-2-6, A-2-4, A-4, A-6	0	0-15	65-90	50-75	40-75	30-70	0-40	7-15
	10-30	Gravelly silty clay loam, clay loam, silty clay loam.	MH, SM, ML	A-7	0	0-15	80-100	50-100	50-100	40-95	40-65	14-30
	30-60	Gravelly silt loam, silty clay loam, sandy loam.	GM, ML, SM	A-2, A-7, A-4, A-5	0	0-15	60-100	50-100	45-100	25-95	0-50	NP-15
LhA:												
Lehigh----------	0-8	Channery silt loam.	GM, ML	A-4	0	0-10	55-80	50-75	45-75	40-70	25-30	5-10
	8-30	Very channery silt loam, channery silty clay loam.	CL, GC, ML, GM	A-4, A-6	0	0-10	55-90	45-85	40-80	40-70	29-40	5-15
	30-42	Channery silty clay loam, very channery silt loam, extremely channery silt loam.	CL, ML, GC, GM	A-2, A-1, A-4, A-6	0-1	0-20	25-70	15-65	10-60	10-55	29-40	5-15
	42-52	Unweathered bedrock.			---	---	---	---	---	---	---	---
LhB:												
Lehigh----------	0-8	Channery silt loam.	GM, ML	A-4	0	0-10	55-80	50-75	45-75	40-70	25-30	5-10
	8-30	Very channery silt loam, channery silty clay loam.	CL, GC, ML, GM	A-4, A-6	0	0-10	55-90	45-85	40-80	40-70	29-40	5-15
	30-42	Channery silty clay loam, very channery silt loam, extremely channery silt loam.	CL, ML, GC, GM	A-2, A-1, A-4, A-6	0-1	0-20	25-70	15-65	10-60	10-55	29-40	5-15
	42-52	Unweathered bedrock.			---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
LhC:												
Lehigh----------	0-8	Channery silt loam.	GM, ML	A-4	0	0-10	55-80	50-75	45-75	40-70	25-30	5-10
	8-30	Very channery silt loam, channery silty clay loam.	CL, GC, ML, GM	A-4, A-6	0	0-10	55-90	45-85	40-80	40-70	29-40	5-15
	30-42	Channery silty clay loam, very channery silt loam, extremely channery silt loam.	GC, GM, CL, ML	A-2, A-1, A-4, A-6	0-1	0-20	25-70	15-65	10-60	10-55	29-40	5-15
	42-52	Unweathered bedrock.			---	---	---	---	---	---	---	---
LhD:												
Lehigh----------	0-8	Channery silt loam.	GM, ML	A-4	0	0-10	55-80	50-75	45-75	40-70	25-30	5-10
	8-30	Very channery silt loam, channery silty clay loam.	CL, GC, ML, GM	A-4, A-6	0	0-10	55-90	45-85	40-80	40-70	29-40	5-15
	30-42	Channery silty clay loam, very channery silt loam, extremely channery silt loam.	GC, CL, GM, ML	A-2, A-1, A-4, A-6	0-1	0-20	25-70	15-65	10-60	10-55	29-40	5-15
	42-52	Unweathered bedrock.			---	---	---	---	---	---	---	---
LkB:												
Lehigh----------	0-8	Very stony silt loam.	CL, GM, ML	A-4	1-5	3-10	60-100	55-100	50-100	45-95	25-30	NP-10
	8-30	Very channery silt loam, channery silty clay loam.	GC, CL, GM, ML	A-4, A-6	0-1	0-10	55-90	45-85	40-80	40-70	29-40	5-15
	30-42	Channery silty clay loam, very channery silt loam.	GC, GM, CL, ML	A-2, A-1, A-4, A-6	0-2	0-20	35-70	15-65	10-60	10-55	29-40	5-15
	42-52	Unweathered bedrock.			---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
LrB:												
Lewisberry------	0-12	Gravelly sandy loam.	GM, SM	A-2, A-4	0	0-10	70-90	65-85	50-80	25-45	0-14	---
	12-46	Sandy loam, gravelly sandy loam, very gravelly sandy loam.	GC, GM, SM, SC	A-4, A-2, A-6	0	0-10	55-100	50-100	40-90	25-50	17-31	1-11
	46-62	Gravelly sandy loam, very gravelly sandy loam, extremely gravelly sandy loam.	GC, GC-GM, GP-GM, GM	A-1, A-2	0	0-20	30-50	20-45	15-30	5-15	15-30	NP-10
	62-72	Unweathered bedrock.			---	---	---	---	---	---	---	---
LrC:												
Lewisberry------	0-12	Gravelly sandy loam.	GM, SM	A-2, A-4	0	0-10	70-90	65-85	50-80	25-45	0-14	---
	12-46	Sandy loam, gravelly sandy loam, very gravelly sandy loam.	GC, GM, SM, SC	A-4, A-2, A-6	0	0-10	55-100	50-100	40-90	25-50	17-31	1-11
	46-62	Gravelly sandy loam, very gravelly sandy loam, extremely gravelly sandy loam.	GC, GP-GM, GC-GM, GM	A-1, A-2	0	0-20	30-50	20-45	15-30	5-15	15-30	NP-10
	62-72	Unweathered bedrock.			---	---	---	---	---	---	---	---
LSD:												
Lewisberry------	0-12	Very stony sandy loam.	SM	A-2, A-4	---	3-10	70-100	65-95	50-85	25-45	0-14	---
	12-46	Sandy loam, gravelly sandy loam, very gravelly sandy loam.	GM, GC, SC, SM	A-4, A-2, A-6	---	0-10	55-100	50-100	40-90	25-50	17-31	1-11
	46-62	Gravelly sandy loam, very gravelly sandy loam.	GM, GP-GM	A-1	---	0-20	30-50	20-45	15-30	5-15	15-30	NP-10
	62-72	Unweathered bedrock.			---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
LSD:												
Lansdale	0-10	Very stony loam	GC-GM, GM, SM, SC-SM	A-1, A-2, A-4	5-10	10-20	65-75	55-70	40-60	20-40	15-25	NP-5
	10-30	Sandy loam, sandy clay loam, channery sandy loam.	SC, GM, SC-SM, SM	A-1, A-2	0-2	0-10	60-90	60-80	45-65	20-35	20-30	3-10
	30-47	Channery sandy loam, very channery sandy loam.	GM, GC-GM, SC-SM, SM	A-1	0-2	5-20	55-80	50-70	30-45	15-25	15-25	NP-5
	47-57	Unweathered bedrock.			---	---	---	---	---	---	---	---
Lw:												
Lindside	0-8	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	80-100	55-90	20-35	2-15
	8-31	Silty clay loam, silt loam, very fine sandy loam.	CL-ML, CL, ML	A-4, A-6	0	0	100	95-100	90-100	70-95	25-40	4-18
	31-60	Stratified silty clay loam to gravelly sandy loam.	ML, SC, CL, SM	A-2, A-6, A-4	0	0	60-100	55-100	45-100	30-95	20-40	4-18
MdA:												
Mount Lucas	0-8	Silt loam	ML	A-4	0	0-5	95-100	80-100	75-95	60-90	0-14	NP
	8-37	Silt loam, gravelly silty clay loam, sandy clay loam.	GM, ML, SM	A-2, A-4, A-7, A-5	0	0-10	70-95	55-95	45-95	30-90	30-49	3-15
	37-60	Gravelly clay loam, gravelly loam, gravelly loamy sand.	GM, SP-SM, ML, SM	A-2, A-1, A-4, A-6	0-1	0-10	45-80	30-70	15-70	10-55	25-40	NP-11
MdB:												
Mount Lucas	0-8	Silt loam	ML	A-4	0	0-5	95-100	80-100	75-95	60-90	0-14	NP
	8-37	Silt loam, gravelly silty clay loam, sandy clay loam.	GM, ML, SM	A-4, A-2, A-5, A-7	0	0-10	70-95	55-95	45-95	30-90	30-49	3-15
	37-60	Gravelly clay loam, gravelly loam, gravelly loamy sand.	GM, SP-SM, ML, SM	A-2, A-1, A-4, A-6	0-1	0-10	45-80	30-70	15-70	10-55	25-40	NP-11

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
MeB:												
Mount Lucas-----	0-9	Very stony silt loam.	ML, SM	A-4	1-5	3-10	75-100	55-75	50-70	35-55	0-14	NP
	9-38	Silt loam, gravelly silty clay loam, sandy clay loam.	GM, ML, SM	A-2, A-4, A-7, A-5	0-1	0-10	70-95	55-95	45-95	30-90	30-49	3-15
	38-60	Gravelly clay loam, gravelly loam, gravelly loamy sand.	GM, SP-SM, ML, SM	A-1, A-6, A-2, A-4	0-1	0-10	45-80	30-70	15-70	10-55	25-40	NP-11
MOB:												
Mt. Airy--------	0-8	Channery loam--	GM, ML	A-4, A-2, A-6	0	0-10	40-60	40-60	25-60	20-55	32-40	6-12
	8-32	Channery silt loam, very channery loam, extremely channery clay loam.	GM, GP-GM	A-1, A-2	0-1	0-15	35-50	30-50	25-40	10-25	26-40	4-12
	32-42	Weathered bedrock.			---	---	---	---	---	---	---	---
Manor-----------	0-8	Channery loam--	GM, ML, SM	A-2-6, A-4, A-2-4, A-6	0	0-10	65-100	50-75	40-75	30-70	32-40	6-12
	8-24	Loam, silt loam, channery loam.	GM, SM, ML	A-2-6, A-2-4, A-4, A-6	0	0-10	65-100	50-100	40-100	30-90	26-40	4-12
	24-60	Loam, sandy loam, channery sandy loam.	CL-ML, ML, SM, SC-SM	A-2, A-4, A-1, A-6	0-2	0-5	65-100	50-100	30-95	15-75	20-40	2-12
MOC:												
Mt. Airy--------	0-8	Channery loam--	GM, ML	A-4, A-2, A-6	0	0-10	40-60	40-60	25-60	20-55	32-40	6-12
	8-32	Channery silt loam, very channery loam, extremely channery clay loam.	GM, GP-GM	A-1, A-2	0-1	0-15	35-50	30-50	25-40	10-25	26-40	4-12
	32-42	Weathered bedrock.			---	---	---	---	---	---	---	---
Manor-----------	0-8	Channery loam--	GM, ML, SM	A-2-4, A-2-6, A-6, A-4	0	0-10	65-100	50-75	40-75	30-70	32-40	6-12
	8-24	Loam, silt loam, channery loam.	GM, ML, SM	A-2-6, A-2-4, A-4, A-6	0	0-10	65-100	50-100	40-100	30-90	26-40	4-12
	24-60	Loam, sandy loam, channery sandy loam.	ML, SC-SM, CL-ML, SM	A-2, A-1, A-4, A-6	0-2	0-5	65-100	50-100	30-95	15-75	20-40	2-12

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
MOD:												
Mt. Airy--------	0-8	Channery loam--	GM, ML	A-4, A-2, A-6	0	0-10	40-60	40-60	25-60	20-55	32-40	6-12
	8-32	Channery silt loam, very channery loam, extremely channery clay loam.	GM, GP-GM	A-1, A-2	0-2	0-15	35-50	30-50	25-40	10-25	26-40	4-12
	32-42	Weathered bedrock.			---	---	---	---	---	---	---	---
Manor-----------	0-8	Channery loam--	GM, ML, SM	A-2-4, A-2-6, A-6, A-4	0	0-10	65-100	50-75	40-75	30-70	32-40	6-12
	8-24	Loam, silt loam, channery loam.	GM, SM, ML	A-2-6, A-2-4, A-4, A-6	0	0-10	65-100	50-100	40-100	30-90	26-40	4-12
	24-60	Loam, sandy loam, channery sandy loam.	CL-ML, ML, SM, SC-SM	A-1, A-6, A-2, A-4	0-1	0-5	65-100	50-100	30-95	15-75	20-40	2-12
MOE:												
Mt. Airy--------	0-8	Channery loam--	GM, ML	A-2, A-4, A-6	0	0-10	40-60	40-60	25-60	20-55	32-40	6-12
	8-32	Channery silt loam, very channery loam, extremely channery clay loam.	GM, GP-GM	A-1, A-2	0-2	0-15	35-50	30-50	25-40	10-25	26-40	4-12
	32-42	Weathered bedrock.			---	---	---	---	---	---	---	---
Manor-----------	0-8	Channery loam--	GM, ML, SM	A-2-6, A-2-4, A-4, A-6	0	0-10	65-100	50-75	40-75	30-70	32-40	6-12
	8-24	Loam, silt loam, channery loam.	GM, ML, SM	A-2-4, A-2-6, A-6, A-4	0	0-10	65-100	50-100	40-100	30-90	26-40	4-12
	24-60	Loam, sandy loam, channery sandy loam.	CL-ML, SM, ML, SC-SM	A-2, A-1, A-4, A-6	0-1	0-5	65-100	50-100	30-95	15-75	20-40	2-12
MPD:												
Mt. Airy--------	0-8	Very stony loam	GM, ML	A-1-b, A-2, A-4	1-5	5-15	40-60	40-60	25-60	20-55	32-40	6-12
	8-32	Channery silt loam, very channery loam, extremely channery clay loam.	GM, GP-GM	A-1, A-2	0-1	0-15	35-50	30-50	25-40	10-25	26-40	4-12
	32-42	Weathered bedrock.			---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
MPD:												
Manor-----------	0-8	Very stony loam	GM, SM, ML	A-4, A-6	1-5	3-15	70-100	60-100	50-95	35-90	32-40	6-12
	8-24	Loam, silt loam, channery loam.	GM, ML, SM	A-4, A-6	0	0-10	70-95	60-95	50-95	35-85	26-40	4-12
	24-60	Loam, sandy loam, channery sandy loam.	ML, SC-SM, CL-ML, SM	A-2, A-1, A-4, A-6	0-1	0-5	70-100	60-100	35-95	20-75	20-40	2-12
MRF:												
Mt. Airy--------	0-8	Very stony loam	GM, ML	A-1-b, A-2, A-4	5-10	5-15	40-60	40-60	25-60	20-55	32-40	6-12
	8-32	Channery silt loam, very channery loam, extremely channery clay loam.	GM, GP-GM	A-1, A-2	0	0-15	35-50	30-50	25-40	10-25	26-40	4-12
	32-42	Weathered bedrock.			---	---	---	---	---	---	---	---
Manor-----------	0-8	Very stony loam	GM, ML, SM	A-4, A-6	5-10	3-15	70-100	60-100	50-95	35-90	32-40	6-12
	8-24	Loam, silt loam, channery loam.	GM, SM, ML	A-4, A-6	0-1	0-10	70-95	60-95	50-95	35-85	26-40	4-12
	24-60	Loam, sandy loam, channery sandy loam.	CL-ML, ML, SM, SC-SM	A-2, A-1, A-4, A-6	0-2	0-5	70-100	60-100	35-95	20-75	20-40	2-12
MvB:												
Murrill---------	0-10	Channery loam--	CL, SC-SM, GM, ML	A-2, A-4, A-6	0	0-5	65-80	55-70	45-65	30-65	20-40	3-15
	10-36	Channery silty clay loam, channery sandy clay loam, channery clay loam.	CL, CL-ML, ML	A-6, A-4, A-7	0	0-15	65-85	60-70	55-65	50-65	20-50	5-25
	36-86	Clay loam, clay, channery clay loam.	CH, MH, CL	A-6, A-7	0-1	0-20	80-100	65-100	60-100	55-100	35-75	20-40
MvC:												
Murrill---------	0-10	Channery loam--	GM, CL, ML, SC-SM	A-2, A-6, A-4	0	0-5	65-80	55-70	45-65	30-65	20-40	3-15
	10-36	Channery silty clay loam, channery sandy clay loam, channery clay loam.	CL-ML, CL, ML	A-4, A-6, A-7	0	0-15	65-85	60-70	55-65	50-65	20-50	5-25
	36-86	Clay loam, clay, channery clay loam.	CL, CH, MH	A-6, A-7	0-1	0-20	80-100	65-100	60-100	55-100	35-75	20-40

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
NaB:												
Neshaminy	0-8	Gravelly silt loam.	CL, ML	A-4, A-6	0	0-10	70-90	65-80	60-75	55-65	0-14	---
	8-70	Silt loam, gravelly silty clay loam, gravelly sandy clay loam.	MH, ML, GM, SM	A-2, A-4, A-7, A-6	0-1	0-40	60-100	55-100	45-100	30-75	25-55	NP-22
NaC:												
Neshaminy	0-8	Gravelly silt loam.	CL, ML	A-4, A-6	0	0-10	70-90	65-80	60-75	55-65	0-14	---
	8-70	Silt loam, gravelly silty clay loam, gravelly sandy clay loam.	GM, MH, SM, ML	A-4, A-2, A-6, A-7	0-1	0-40	60-100	55-100	45-100	30-75	25-55	NP-22
NdB:												
Neshaminy	0-8	Extremely stony silt loam.	CL, ML	A-4, A-6	5-25	5-20	80-100	70-100	60-100	55-85	30-40	NP-5
	8-70	Silt loam, gravelly silty clay loam, gravelly sandy clay loam.	MH, ML, GM, SM	A-2, A-4, A-7, A-6	0-2	0-40	60-100	55-100	45-100	30-75	25-55	NP-22
NdD:												
Neshaminy	0-8	Extremely stony silt loam.	CL, ML	A-4, A-6	5-25	5-20	80-100	70-100	60-100	55-85	30-40	NP-5
	8-70	Silt loam, gravelly silty clay loam, gravelly sandy clay loam.	MH, ML, GM, SM	A-4, A-2, A-6, A-7	0-2	0-40	60-100	55-100	45-100	30-75	25-55	NP-22
NdE:												
Neshaminy	0-8	Extremely stony silt loam.	CL, ML	A-4, A-6	5-25	5-20	80-100	70-100	60-100	55-85	30-40	NP-5
	8-70	Silt loam, gravelly silty clay loam, gravelly sandy clay loam.	GM, MH, SM, ML	A-4, A-2, A-6, A-7	0-2	0-40	60-100	55-100	45-100	30-75	25-55	NP-22
Pa:												
Penlaw	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	95-100	90-100	70-100	10-40	5-25
	10-20	Silty clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	0-5	95-100	95-100	90-100	70-100	10-40	5-25
	20-47	Silty clay loam, silt loam, gravelly silt loam.	CH, CL-ML, CL	A-4, A-7, A-6	0	0-5	85-100	75-100	55-100	50-95	15-55	6-30
	47-60	Silty clay, clay, loam.	CL, CH, GC, SC	A-6, A-4, A-7	0	0-20	65-100	60-100	55-100	40-95	15-55	6-30

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
PbB:												
Penn------------	0-9	Very stony loam	GM, ML	A-4	1-5	3-15	60-100	50-100	45-95	35-85	0-14	---
	9-30	Channery silt loam, channery loam.	GM, SM, ML	A-2, A-4	0-1	0-10	55-100	50-100	45-95	30-75	20-37	1-10
	30-38	Very channery silt loam, very channery loam.	GM, CL, ML, SM	A-1, A-4, A-2	0-1	0-15	35-100	20-100	15-95	15-70	20-35	3-10
	38-48	Unweathered bedrock.			---	---	---	---	---	---	---	---
PbD:												
Penn------------	0-9	Very stony loam	GM, ML	A-4	1-5	3-15	60-100	50-100	45-95	35-85	0-14	---
	9-30	Channery silt loam, channery loam.	GM, SM, ML	A-2, A-4	0-1	0-10	55-100	50-100	45-95	30-75	20-37	1-10
	30-38	Very channery silt loam, very channery loam.	CL, GM, SM, ML	A-1, A-2, A-4	0-1	0-15	35-100	20-100	15-95	15-70	20-35	3-10
	38-48	Unweathered bedrock.			---	---	---	---	---	---	---	---
PcF:												
Penn------------	0-9	Very stony loam	GM, ML	A-4	1-5	3-15	60-100	50-100	45-95	35-85	0-14	---
	9-30	Channery silt loam, channery loam.	GM, SM, ML	A-2, A-4	0-1	0-10	55-100	50-100	45-95	30-75	20-37	1-10
	30-38	Very channery silt loam, very channery loam.	CL, GM, SM, ML	A-1, A-2, A-4	0-1	0-15	35-100	20-100	15-95	15-70	20-35	3-10
	38-48	Unweathered bedrock.			---	---	---	---	---	---	---	---
PeB:												
Penn------------	0-9	Silt loam------	ML	A-4	0	0-5	95-100	80-100	85-95	60-85	0-14	---
	9-30	Channery silt loam, channery loam, channery silty clay loam.	GM, ML, SM	A-2, A-4	0	0-10	55-100	50-100	45-95	30-75	20-37	1-10
	30-38	Very channery silt loam, very channery loam.	GM, CL, ML, SM	A-1, A-4, A-2	0	0-15	35-100	20-100	15-95	15-70	20-35	3-10
	38-48	Unweathered bedrock.			---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
PeC:												
Penn------------	0-9	Silt loam------	ML	A-4	0	0-5	95-100	80-100	85-95	60-85	0-14	---
	9-30	Channery silt loam, channery loam, channery silty clay loam.	GM, ML, SM	A-2, A-4	0	0-10	55-100	50-100	45-95	30-75	20-37	1-10
	30-38	Very channery silt loam, very channery loam.	GM, CL, ML, SM	A-1, A-2, A-4	0	0-15	35-100	20-100	15-95	15-70	20-35	3-10
	38-48	Unweathered bedrock.			---	---	---	---	---	---	---	---
PoB:												
Penn------------	0-9	Channery silt loam.	GM, ML	A-4	0	0-10	60-90	50-80	45-75	40-65	0-14	---
	9-30	Channery silt loam, channery loam, channery silty clay loam.	GM, SM, ML	A-2, A-4	0	0-10	55-100	50-100	45-95	30-75	20-37	1-10
	30-38	Very channery silt loam, very channery loam.	GM, ML, CL, SM	A-1, A-4, A-2	0	0-15	35-100	20-100	15-95	15-70	20-35	3-10
	38-48	Unweathered bedrock.			---	---	---	---	---	---	---	---
Klinesville-----	0-8	Channery silt loam.	GM, SM	A-2, A-4	0	0-10	55-85	45-60	35-50	25-40	0-14	NP
	8-14	Channery silt loam, very channery silt loam.	GM, GP, SP, SM	A-2, A-1, A-4	0	0-10	25-75	15-55	10-50	4-40	20-35	NP-9
	14-16	Channery silt loam, very channery silt loam.	GM, GP, SP, SM	A-1, A-2	0	0-20	15-60	10-50	10-40	4-30	20-35	NP-7
	16-26	Weathered bedrock.			---	---	---	---	---	---	0-14	---
PoC:												
Penn------------	0-9	Channery silt loam.	GM, ML	A-4	0	0-10	60-90	50-80	45-75	40-65	0-14	---
	9-30	Channery silt loam, channery loam, channery silty clay loam.	GM, SM, ML	A-2, A-4	0	0-10	55-100	50-100	45-95	30-75	20-37	1-10
	30-38	Very channery silt loam, very channery loam.	CL, GM, SM, ML	A-1, A-4, A-2	0	0-15	35-100	20-100	15-95	15-70	20-35	3-10
	38-48	Unweathered bedrock.			---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
PoC:												
Klinesville-----	0-8	Channery silt loam.	GM, SM	A-2, A-4	0	0-10	55-85	45-60	35-50	25-40	0-14	NP
	8-14	Channery silt loam, very channery silt loam.	GM, GP, SP, SM	A-1, A-2, A-4	0	0-10	25-75	15-55	10-50	4-40	20-35	NP-9
	14-16	Channery silt loam, very channery silt loam.	GM, GP, SP, SM	A-1, A-2	0	0-20	15-60	10-50	10-40	4-30	20-35	NP-7
	16-26	Weathered bedrock.			---	---	---	---	---	---	0-14	---
PpB:												
Penn------------	0-9	Silt loam------	ML	A-4	0	0-5	95-100	80-100	85-95	60-85	0-14	---
	9-30	Channery silt loam, channery loam, channery silty clay loam.	GM, ML, SM	A-2, A-4	0	0-10	55-100	50-100	45-95	30-75	20-37	1-10
	30-38	Very channery silt loam, very channery loam.	CL, GM, SM, ML	A-2, A-1, A-4	0	0-15	35-100	20-100	15-95	15-70	20-35	3-10
	38-48	Unweathered bedrock.			---	---	---	---	---	---	---	---
Lansdale--------	0-10	Loam-----------	CL-ML, ML, SM, SC-SM	A-2, A-4	0	0-2	80-95	75-95	55-80	30-60	15-25	NP-5
	10-30	Sandy loam, sandy clay loam, channery sandy loam.	SC, SM, SC-SM	A-2	0	0-10	80-90	75-85	50-70	25-35	20-30	3-10
	30-47	Channery sandy loam, very channery sandy loam.	SC, GM, SC-SM, SM	A-1, A-2	0	0-20	55-80	50-70	30-45	15-25	20-25	3-8
	47-57	Unweathered bedrock.			---	---	---	---	---	---	---	---
PpC:												
Penn------------	0-9	Channery silt loam.	GM, ML	A-4	0	0-10	60-90	50-80	45-75	40-65	0-14	---
	9-30	Channery silt loam, channery loam, channery silty clay loam.	GM, SM, ML	A-2, A-4	0	0-10	55-100	50-100	45-95	30-75	20-37	1-10
	30-38	Very channery silt loam, very channery loam.	GM, CL, ML, SM	A-2, A-1, A-4	0	0-15	35-100	20-100	15-95	15-70	20-35	3-10
	38-48	Unweathered bedrock.			---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
PpC:												
Lansdale--------	0-10	Channery loam--	CL-ML, ML	A-4	0	0-10	80-90	75-85	65-75	50-60	15-25	NP-5
	10-30	Sandy loam, sandy clay loam, channery sandy loam.	SC, SM, SC-SM	A-2	0	0-10	80-90	75-85	50-70	25-35	20-30	3-10
	30-47	Channery sandy loam, very channery sandy loam.	GM, SC, SM, SC-SM	A-1, A-2	0	0-20	55-80	50-70	30-45	15-25	20-25	3-8
	47-57	Unweathered bedrock.			---	---	---	---	---	---	---	---
PsB:												
Pequea----------	0-8	Silt loam------	ML, SM	A-2, A-4	0	0	90-100	90-100	65-95	35-85	20-30	NP-6
	8-24	Silt loam, channery loam, channery sandy loam.	GM, SM, ML	A-2, A-4	---	0-5	70-95	60-95	55-90	35-80	20-35	NP-10
	24-60	Loam, channery loam, channery sandy loam.	GM, ML, SM	A-2, A-4	---	0-10	70-95	55-90	50-90	35-70	20-35	NP-10
	60-70	Unweathered bedrock.			---	---	---	---	---	---	---	---
PsC:												
Pequea----------	0-8	Silt loam------	ML, SM	A-2, A-4	0	0	90-100	90-100	65-95	35-85	20-30	NP-6
	8-24	Silt loam, channery loam, channery sandy loam.	GM, SM, ML	A-2, A-4	---	0-5	70-95	60-95	55-90	35-80	20-35	NP-10
	24-60	Loam, channery loam, channery sandy loam.	ML, GM, SM	A-2, A-4	---	0-10	70-95	55-90	50-90	35-70	20-35	NP-10
	60-70	Unweathered bedrock.			---	---	---	---	---	---	---	---
PsD:												
Pequea----------	0-8	Silt loam------	ML, SM	A-2, A-4	0	0	90-100	90-100	65-95	35-85	20-30	NP-6
	8-24	Silt loam, channery loam, channery sandy loam.	GM, SM, ML	A-2, A-4	---	0-5	70-95	60-95	55-90	35-80	20-35	NP-10
	24-60	Loam, channery loam, channery sandy loam.	ML, GM, SM	A-2, A-4	---	0-10	70-95	55-90	50-90	35-70	20-35	NP-10
	60-70	Unweathered bedrock.			---	---	---	---	---	---	---	---
Pt:												
Pits, quarries.												

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
RaA:												
Raritan---------	0-9	Silt loam------	ML, SM	A-4	0	0	85-100	75-90	60-90	45-80	0-14	---
	9-26	Clay loam, loam, silt loam.	CL, ML	A-4, A-6	0	0-5	90-100	80-95	70-90	50-70	25-35	3-11
	26-54	Clay loam, loam, silt loam.	CL, ML	A-4, A-6	0	0-5	90-100	80-95	70-90	50-70	25-35	3-11
	54-60	Stratified gravelly loamy sand to silty clay loam.	GW-GM, GM, ML, SM	A-1, A-2, A-4	0-1	0-10	60-100	40-90	20-90	10-85	25-35	NP-7
RaB:												
Raritan---------	0-9	Silt loam------	ML, SM	A-4	0	0	85-100	75-90	60-90	45-80	0-14	---
	9-26	Clay loam, loam, silt loam.	CL, ML	A-4, A-6	0	0-5	90-100	80-95	70-90	50-70	25-35	3-11
	26-54	Clay loam, loam, silt loam.	CL, ML	A-4, A-6	0	0-5	90-100	80-95	70-90	50-70	25-35	3-11
	54-60	Stratified gravelly loamy sand to silty clay loam.	GM, GW-GM, SM, ML	A-1, A-2, A-4	0-1	0-10	60-100	40-90	20-90	10-85	25-35	NP-7
ReA:												
Readington------	0-10	Silt loam------	ML	A-4	0	0-5	90-100	80-100	80-100	65-100	0-14	NP
	10-27	Loam, channery silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	0-10	80-100	70-100	65-100	55-95	25-39	5-12
	27-46	Silt loam, channery loam, channery silt loam.	CL, GM, SM, ML	A-4, A-2, A-6	0	0-10	60-95	40-90	30-85	25-55	20-35	NP-12
	46-56	Weathered bedrock.			---	---	---	---	---	---	---	---
ReB:												
Readington------	0-10	Silt loam------	ML	A-4	0	0-5	90-100	80-100	80-100	65-100	0-14	NP
	10-27	Loam, channery silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	0-10	80-100	70-100	65-100	55-95	25-39	5-12
	27-46	Silt loam, channery loam, channery silt loam.	GM, CL, ML, SM	A-2, A-4, A-6	0	0-10	60-95	40-90	30-85	25-55	20-35	NP-12
	46-56	Weathered bedrock.			---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
RfB:												
Reaville--------	0-9	Channery silt loam.	ML	A-4	0	0-10	80-95	70-90	60-85	55-85	0-14	NP
	9-15	Silt loam, channery silt loam, channery silty clay loam.	CL, CL-ML, SC, GC	A-4, A-6	0	0-15	65-90	55-85	45-75	40-75	25-39	5-15
	15-25	Channery silt loam, very channery silt loam, very channery loam.	GM, CL-ML, ML	A-1-b, A-4, A-2	0	0-40	55-80	40-75	30-70	20-65	25-35	5-10
	25-35	Unweathered bedrock.			---	---	---	---	---	---	---	---
RfC:												
Reaville--------	0-9	Channery silt loam.	ML	A-4	0	0-10	80-95	70-90	60-85	55-85	0-14	NP
	9-15	Silt loam, channery silt loam, channery silty clay loam.	CL, CL-ML, SC, GC	A-4, A-6	0	0-15	65-90	55-85	45-75	40-75	25-39	5-15
	15-25	Channery silt loam, very channery silt loam, very channery loam.	GM, CL-ML, ML	A-1-b, A-4, A-2	0	0-40	55-80	40-75	30-70	20-65	25-35	5-10
	25-35	Unweathered bedrock.			---	---	---	---	---	---	---	---
Rw:												
Rowland---------	0-10	Silt loam------	ML, SM	A-4	0	0-5	95-100	95-100	75-100	35-95	0-14	---
	10-28	Silt loam, loam, sandy clay loam.	ML, SM	A-4, A-6, A-7	0	0-5	95-100	95-100	75-100	35-95	24-45	NP-15
	28-44	Sandy clay, silt loam, gravelly silty clay loam.	ML, SM	A-4, A-6, A-7	0	0-10	90-100	70-100	65-100	35-95	25-50	3-17
	44-60	Stratified sand to gravel.	GM, SC, GC, SM	A-1, A-2	0-1	0-15	55-80	30-70	20-40	15-30	0-14	---
StC:												
Steinsburg------	0-10	Gravelly sandy loam.	ML, CL, SC-SM, SM	A-4	0	0-15	80-95	65-85	35-60	35-55	0-25	5-10
	10-20	Loam, gravelly sandy loam, fine sandy loam.	SC-SM, SM	A-2, A-1, A-4	0	0-10	75-95	65-85	35-60	15-40	0-25	NP-5
	20-26	Gravelly sandy loam, very gravelly loamy sand.	GM, SM	A-1, A-2	0	10-40	45-85	40-80	35-60	15-35	0-25	NP-3
	26-36	Unweathered bedrock.			---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
StD:												
Steinsburg------	0-10	Gravelly sandy loam.	CL, SM, ML, SC-SM	A-4	0	0-15	80-95	65-85	35-60	35-55	0-25	5-10
	10-20	Loam, gravelly sandy loam, fine sandy loam.	SC-SM, SM	A-1, A-4, A-2	0	0-10	75-95	65-85	35-60	15-40	0-25	NP-5
	20-26	Gravelly sandy loam, very gravelly loamy sand.	GM, SM	A-1, A-2	0	10-40	45-85	40-80	35-60	15-35	0-25	NP-3
	26-36	Unweathered bedrock.			---	---	---	---	---	---	---	---
Uc*:												
Urban land------	0-6	Variable-------	---	---	---	---	---	---	---	---	0-14	---
UdB*:												
Urban land------	0-6	Variable-------	---	---	---	---	---	---	---	---	0-14	---
Chester---------	0-11	Silt loam------	CL, CL-ML	A-4	0	0-10	85-100	80-100	70-100	50-90	22-27	5-10
	11-36	Silty clay loam, silt loam, clay loam.	CL, ML	A-4, A-6, A-7	0	0-10	85-100	80-100	70-100	55-95	30-50	8-17
	36-60	Silt loam, loam, sandy loam.	ML, SM	A-2, A-4, A-7	0	0-10	80-100	80-100	60-100	30-90	0-47	4-12
UeB*:												
Urban land------	0-6	Variable-------	---	---	---	---	---	---	---	---	0-14	---
Conestoga-------	0-9	Silt loam------	ML	A-4	---	0-5	90-100	85-100	80-100	70-90	20-30	NP-6
	9-40	Silt loam, silty clay loam, channery silt loam.	CH, CL, MH	A-6, A-7	---	0-10	70-100	65-100	60-100	55-95	35-60	14-30
	40-60	Channery silt loam, channery loam, channery sandy loam.	GM, SM, MH, ML	A-2, A-7, A-6	---	0-15	35-90	35-85	30-80	25-75	35-60	10-25
UfC*:												
Urban land------	0-6	Variable-------	---	---	---	---	---	---	---	---	0-14	---
Mt. Airy--------	0-8	Channery silt loam.	GM, ML	A-2, A-6, A-4	---	0-10	40-60	40-60	25-60	20-55	32-40	6-12
	8-32	Channery silt loam, very channery loam, extremely channery clay loam.	GM, GP-GM	A-1, A-2	---	0-15	35-50	30-50	25-40	10-25	26-40	4-12
	32-42	Weathered bedrock.			---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
UgB*:												
Urban land	0-6	Variable	---	---	---	---	---	---	---	---	0-14	---
Penn	0-9	Silt loam	ML	A-4	0	0-5	95-100	80-100	85-95	60-85	0-14	---
	9-30	Channery silt loam, channery loam, channery silty clay loam.	GM, ML, SM	A-2, A-4	0	0-10	55-100	50-100	45-95	30-75	20-37	1-10
	30-38	Very channery silt loam, very channery loam.	CL, GM, SM, ML	A-1, A-2, A-4	0	0-15	35-100	20-100	15-95	15-70	20-35	3-10
	38-48	Unweathered bedrock.			---	---	---	---	---	---	---	---
WaA:												
Watchung	0-9	Silt loam	ML	A-4, A-7, A-6	0	0-15	85-100	80-100	70-100	50-95	35-45	8-14
	9-40	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	0-15	85-100	80-100	70-100	60-95	40-65	15-35
	40-60	Silt loam, silty clay loam, loam.	ML	A-6, A-7	0	0-15	85-100	80-100	70-100	50-95	35-45	10-15
WaB:												
Watchung	0-9	Silt loam	ML	A-4, A-6, A-7	0	0-15	85-100	80-100	70-100	50-95	35-45	8-14
	9-40	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	0-15	85-100	80-100	70-100	60-95	40-65	15-35
	40-60	Silt loam, silty clay loam, loam.	ML	A-6, A-7	0	0-15	85-100	80-100	70-100	50-95	35-45	10-15
WbB:												
Watchung	0-9	Extremely stony silt loam.	ML	A-6, A-4, A-7	5-10	10-60	85-100	80-100	70-100	50-95	35-45	8-14
	9-40	Clay, silty clay, silty clay loam.	CH, ML, CL, MH	A-7	0-1	0-15	85-100	80-100	70-100	60-95	40-65	15-35
	40-60	Silt loam, silty clay loam, loam.	CL, ML	A-6, A-4, A-7	0-1	0-15	85-100	80-100	70-100	50-95	35-45	10-15

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 17.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
ArB:												
Arendtsville----------	0-9	10-25	1.25-1.40	0.60-6.00	0.12-0.16	0.0-2.9	2.0-3.0	.17	.20	4	6	48
	9-53	17-32	1.40-1.60	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.17	.20			
	53-68	10-25	1.50-1.70	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.17	.24			
ArC:												
Arendtsville----------	0-9	10-25	1.25-1.40	0.60-6.00	0.12-0.16	0.0-2.9	2.0-3.0	.17	.20	4	6	48
	9-53	17-32	1.40-1.60	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.17	.20			
	53-68	10-25	1.50-1.70	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.17	.24			
ArD:												
Arendtsville----------	0-9	10-25	1.25-1.40	0.60-6.00	0.12-0.16	0.0-2.9	2.0-3.0	.17	.20	4	6	48
	9-53	17-32	1.40-1.60	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.17	.20			
	53-68	10-25	1.50-1.70	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.17	.24			
AtB:												
Athol-----------------	0-10	10-27	1.20-1.50	0.60-2.00	0.14-0.20	0.0-2.9	2.0-4.0	.28	.32	4	6	48
	10-52	15-35	1.30-1.75	0.60-2.00	0.12-0.16	0.0-2.9	---	.24	.24			
	52-60	15-35	1.30-1.75	0.60-2.00	0.10-0.14	0.0-2.9	---	.24	.28			
AtC:												
Athol-----------------	0-10	10-27	1.20-1.50	0.60-2.00	0.14-0.20	0.0-2.9	2.0-4.0	.28	.32	4	6	48
	10-52	15-35	1.30-1.75	0.60-2.00	0.12-0.16	0.0-2.9	---	.24	.24			
	52-60	15-35	1.30-1.75	0.60-2.00	0.10-0.14	0.0-2.9	---	.24	.28			
Ba:												
Baile-----------------	0-12	15-32	1.20-1.40	0.20-0.60	0.16-0.25	0.0-2.9	1.0-4.0	.43	.43	5	5	56
	12-44	10-35	1.30-1.60	0.06-0.20	0.12-0.24	3.0-5.9	0.0-0.5	.43	.43			
	44-60	10-25	1.30-1.60	0.06-0.60	0.10-0.24	0.0-2.9	0.0-0.5	.43	.43			
Be:												
Bermudian-------------	0-8	10-25	1.25-1.40	0.60-6.00	0.12-0.16	0.0-2.9	2.0-3.0	.37	.37	4	5	56
	8-50	17-35	1.30-1.50	0.60-6.00	0.12-0.16	0.0-2.9	---	.28	.32			
	50-60	5-20	1.35-1.55	6.00-20.00	0.04-0.08	0.0-2.9	---	.17	.24			
BgA:												
Birdsboro-------------	0-10	10-27	1.20-1.50	0.60-2.00	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	4	5	56
	10-60	20-35	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	0.0-0.5	.28	.28			
BgB:												
Birdsboro-------------	0-10	10-27	1.20-1.50	0.60-2.00	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	4	5	56
	10-60	20-35	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	0.0-0.5	.28	.28			
BgC:												
Birdsboro-------------	0-10	10-27	1.20-1.50	0.60-2.00	0.16-0.20	0.0-2.9	1.0-3.0	.37	.37	4	5	56
	10-60	20-35	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	0.0-0.5	.28	.28			
Bo:												
Bowmansville----------	0-11	10-17	1.20-1.40	0.60-2.00	0.16-0.20	0.0-2.9	2.0-4.0	.32	.32	4	5	56
	11-34	15-30	1.30-1.50	0.20-0.60	0.16-0.20	0.0-2.9	0.0-0.5	.28	.28			
	34-60	15-30	1.20-1.50	0.20-2.00	0.12-0.18	0.0-2.9	0.0-0.5	.28	.28			

See footnote at end of table.

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
BrB:												
Brecknock-------------	0-7	10-20	1.20-1.30	0.60-2.00	0.10-0.16	0.0-2.9	2.0-3.0	.24	.32	3	6	48
	7-30	17-32	1.30-1.50	0.60-2.00	0.08-0.14	0.0-2.9	0.0-0.5	.24	.28			
	30-42	17-32	1.30-1.50	0.60-2.00	0.03-0.10	0.0-2.9	0.0-0.5	.24	.32			
	42-52	---	---	0.60-6.00	---	---	---	---	---			
BrC:												
Brecknock-------------	0-7	10-20	1.20-1.30	0.60-2.00	0.10-0.16	0.0-2.9	2.0-3.0	.24	.32	3	6	48
	7-30	17-32	1.30-1.50	0.60-2.00	0.08-0.14	0.0-2.9	0.0-0.5	.24	.28			
	30-42	17-32	1.30-1.50	0.60-2.00	0.03-0.10	0.0-2.9	0.0-0.5	.24	.32			
	42-52	---	---	0.60-6.00	---	---	---	---	---			
BrD:												
Brecknock-------------	0-7	10-20	1.20-1.30	0.60-2.00	0.10-0.16	0.0-2.9	2.0-3.0	.24	.32	3	6	48
	7-30	17-32	1.30-1.50	0.60-2.00	0.08-0.14	0.0-2.9	0.0-0.5	.24	.28			
	30-42	17-32	1.30-1.50	0.60-2.00	0.03-0.10	0.0-2.9	0.0-0.5	.24	.32			
	42-52	---	---	0.60-6.00	---	---	---	---	---			
BsD:												
Brecknock-------------	0-7	10-20	1.20-1.30	0.60-2.00	0.10-0.18	0.0-2.9	2.0-3.0	.24	.32	3	8	0
	7-30	17-32	1.30-1.50	0.60-2.00	0.08-0.14	0.0-2.9	0.0-0.5	.24	.28			
	30-42	17-32	1.30-1.50	0.60-2.00	0.03-0.10	0.0-2.9	0.0-0.5	.24	.32			
	42-52	---	---	0.60-6.00	---	---	---	---	---			
BsF:												
Brecknock-------------	0-7	10-20	1.20-1.30	0.60-2.00	0.10-0.18	0.0-2.9	2.0-3.0	.24	.32	3	8	0
	7-30	17-32	1.30-1.50	0.60-2.00	0.08-0.14	0.0-2.9	0.0-0.5	.24	.28			
	30-42	17-32	1.30-1.50	0.60-2.00	0.03-0.10	0.0-2.9	0.0-0.5	.24	.32			
	42-52	---	---	0.60-6.00	---	---	---	---	---			
CcC:												
Catoctin--------------	0-9	5-20	1.20-1.50	2.00-6.00	0.11-0.16	0.0-2.9	0.5-2.0	.17	.32	2	5	56
	9-16	10-35	1.20-1.50	2.00-6.00	0.08-0.16	0.0-2.9	---	.17	.24			
	16-24	10-25	1.20-1.50	2.00-6.00	0.04-0.15	0.0-2.9	---	.17	.28			
	24-34	---	---	0.00-0.06	---	---	---	---	---			
Cd:												
Chagrin---------------	0-10	10-27	1.20-1.40	0.60-2.00	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	5	5	56
	10-36	18-30	1.20-1.50	0.60-2.00	0.14-0.20	0.0-2.9	---	.32	.37			
	36-60	5-25	1.20-1.40	0.60-2.00	0.08-0.20	0.0-2.9	---	.32	.43			
CeB:												
Chester---------------	0-11	10-23	1.10-1.30	0.60-2.00	0.12-0.16	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	11-36	18-35	1.20-1.50	0.60-2.00	0.10-0.14	0.0-2.9	0.0-0.5	.43	.43			
	36-60	10-24	1.40-1.60	0.60-2.00	0.08-0.12	0.0-2.9	0.0-0.5	.49	.49			
CeC:												
Chester---------------	0-11	10-23	1.10-1.30	0.60-2.00	0.12-0.16	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	11-36	18-35	1.20-1.50	0.60-2.00	0.10-0.14	0.0-2.9	0.0-0.5	.43	.43			
	36-60	10-24	1.40-1.60	0.60-2.00	0.08-0.12	0.0-2.9	0.0-0.5	.49	.49			
CkA:												
Clarksburg------------	0-8	10-27	1.20-1.40	0.60-2.00	0.14-0.20	0.0-2.9	1.0-3.0	.37	.37	3	5	56
	8-32	22-35	1.30-1.50	0.60-2.00	0.12-0.18	3.0-5.9	0.0-0.5	.28	.28			
	32-54	22-35	1.40-1.70	0.06-0.60	0.06-0.12	3.0-5.9	0.0-0.5	.28	.32			
	54-64	22-40	1.20-1.60	0.06-0.60	0.06-0.16	3.0-5.9	0.0-0.5	.28	.32			

See footnote at end of table.

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
CkB:												
Clarksburg	0-8	10-27	1.20-1.40	0.60-2.00	0.14-0.20	0.0-2.9	1.0-3.0	.37	.37	3	5	56
	8-32	22-35	1.30-1.50	0.60-2.00	0.12-0.18	3.0-5.9	0.0-0.5	.28	.28			
	32-54	22-35	1.40-1.70	0.06-0.60	0.06-0.12	3.0-5.9	0.0-0.5	.28	.32			
	54-64	22-40	1.20-1.60	0.06-0.60	0.06-0.16	3.0-5.9	0.0-0.5	.28	.32			
Cm:												
Codorus	0-12	15-25	1.20-1.40	0.60-2.00	0.14-0.20	0.0-2.9	2.0-4.0	.37	.37	5	5	56
	12-48	18-35	1.20-1.50	0.60-2.00	0.14-0.18	0.0-2.9	0.0-0.5	.37	.37			
	48-60	5-12	1.20-1.50	2.00-20.00	0.04-0.08	0.0-2.9	0.0-0.5	.24	.28			
CnA:												
Conestoga	0-9	15-25	1.20-1.40	0.60-2.00	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	4	5	56
	9-40	18-35	1.40-1.60	0.60-2.00	0.12-0.16	0.0-2.9	---	.28	.28			
	40-60	18-35	1.40-1.60	0.60-2.00	0.08-0.12	0.0-2.9	---	.17	.20			
CnB:												
Conestoga	0-9	15-25	1.20-1.40	0.60-2.00	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	4	5	56
	9-40	22-35	1.40-1.60	0.60-2.00	0.12-0.16	0.0-2.9	---	.24	.24			
	40-60	22-35	1.40-1.60	0.60-2.00	0.06-0.10	0.0-2.9	---	.24	.28			
CnC:												
Conestoga	0-9	15-25	1.20-1.40	0.60-2.00	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	4	5	56
	9-40	22-35	1.40-1.60	0.60-2.00	0.12-0.16	0.0-2.9	---	.24	.24			
	40-60	22-35	1.40-1.60	0.60-2.00	0.06-0.10	0.0-2.9	---	.24	.28			
CrA:												
Croton	0-12	15-30	1.28-1.42	0.20-2.00	0.15-0.22	0.0-2.9	3.0-5.0	.43	.43	3	8	0
	12-20	20-35	1.38-1.55	0.20-0.60	0.12-0.20	3.0-5.9	0.5-1.0	.43	.49			
	20-37	20-30	1.65-1.80	0.06-0.20	0.06-0.10	0.0-2.9	0.0-0.5	.43	.49			
	37-42	20-30	1.60-1.80	0.06-0.20	0.08-0.12	0.0-2.9	0.0-0.5	.37	.43			
	42-52	---	---	0.00-0.20	---	---	---	---	---			
CrB:												
Croton	0-12	15-30	1.28-1.42	0.20-2.00	0.15-0.22	0.0-2.9	3.0-5.0	.43	.43	3	8	0
	12-20	20-35	1.38-1.55	0.20-0.60	0.12-0.20	3.0-5.9	0.5-1.0	.43	.49			
	20-37	20-30	1.65-1.80	0.06-0.20	0.06-0.10	0.0-2.9	0.0-0.5	.43	.49			
	37-42	20-30	1.60-1.80	0.06-0.20	0.08-0.12	0.0-2.9	0.0-0.5	.37	.43			
	42-52	---	---	0.00-0.20	---	---	---	---	---			
DuA:												
Duffield	0-10	15-30	1.10-1.40	0.60-2.00	0.16-0.22	0.0-2.9	2.0-4.0	.37	.37	4	6	48
	10-50	20-42	1.30-1.60	0.60-2.00	0.14-0.20	3.0-5.9	0.0-0.5	.28	.28			
	50-60	18-41	1.30-1.60	0.60-2.00	0.14-0.20	3.0-5.9	0.0-0.5	.28	.32			
DuB:												
Duffield	0-10	15-30	1.10-1.40	0.60-2.00	0.16-0.22	0.0-2.9	2.0-4.0	.37	.37	4	6	48
	10-50	20-42	1.30-1.60	0.60-2.00	0.14-0.20	3.0-5.9	0.0-0.5	.28	.28			
	50-60	18-41	1.30-1.60	0.60-2.00	0.14-0.20	3.0-5.9	0.0-0.5	.28	.32			
DuC:												
Duffield	0-10	15-30	1.10-1.40	0.60-2.00	0.16-0.22	0.0-2.9	2.0-4.0	.37	.37	4	6	48
	10-50	20-42	1.30-1.60	0.60-2.00	0.14-0.20	3.0-5.9	0.0-0.5	.28	.28			
	50-60	18-41	1.30-1.60	0.60-2.00	0.14-0.20	3.0-5.9	0.0-0.5	.28	.32			
DWD:												
Duffield	0-10	15-30	1.10-1.40	0.60-2.00	0.16-0.22	0.0-2.9	2.0-4.0	.37	.37	4	6	48
	10-50	20-42	1.30-1.60	0.60-2.00	0.14-0.20	3.0-5.9	0.0-0.5	.28	.28			
	50-60	18-41	1.30-1.60	0.60-2.00	0.14-0.20	3.0-5.9	0.0-0.5	.28	.32			

See footnote at end of table.

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
DWD:												
Hagerstown-----------	0-10	15-35	1.20-1.40	0.60-6.00	0.16-0.24	0.0-2.9	1.0-5.0	.32	.32	4	6	48
	10-18	25-60	1.20-1.60	0.60-2.00	0.10-0.24	3.0-5.9	0.0-0.5	.28	.28			
	18-62	35-60	1.20-1.60	0.60-2.00	0.10-0.24	3.0-5.9	0.0-0.5	.28	.28			
Dx*:												
Dumps, refuse.												
EdB:												
Edgemont-------------	0-8	5-20	1.20-1.40	0.60-6.00	0.10-0.14	0.0-2.9	2.0-3.0	.15	.15	3	6	48
	8-30	18-30	1.30-1.50	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.15	.17			
	30-60	5-30	1.40-1.60	0.60-6.00	0.06-0.10	0.0-2.9	0.0-0.5	.15	.20			
EdC:												
Edgemont-------------	0-8	5-20	1.20-1.40	0.60-6.00	0.10-0.14	0.0-2.9	2.0-3.0	.15	.15	3	6	48
	8-30	18-30	1.30-1.50	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.15	.17			
	30-60	5-30	1.40-1.60	0.60-6.00	0.06-0.10	0.0-2.9	0.0-0.5	.15	.20			
EdD:												
Edgemont-------------	0-8	5-20	1.20-1.40	0.60-6.00	0.10-0.14	0.0-2.9	2.0-3.0	.15	.15	3	6	48
	8-30	18-30	1.30-1.50	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.15	.17			
	30-60	5-30	1.40-1.60	0.60-6.00	0.06-0.10	0.0-2.9	0.0-0.5	.15	.20			
EeB:												
Edgemont-------------	0-8	5-20	1.20-1.40	0.60-6.00	0.10-0.18	0.0-2.9	2.0-4.0	.15	.15	3	8	0
	8-30	18-30	1.30-1.50	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.15	.17			
	30-60	5-30	1.40-1.60	0.60-6.00	0.06-0.10	0.0-2.9	0.0-0.5	.15	.20			
EeD:												
Edgemont-------------	0-8	5-20	1.20-1.40	0.60-6.00	0.10-0.18	0.0-2.9	2.0-4.0	.15	.15	3	8	0
	8-30	18-30	1.30-1.50	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.15	.17			
	30-60	5-30	1.40-1.60	0.60-6.00	0.06-0.10	0.0-2.9	0.0-0.5	.15	.20			
EeF:												
Edgemont-------------	0-8	5-20	1.20-1.40	0.60-6.00	0.10-0.18	0.0-2.9	2.0-4.0	.15	.15	3	8	0
	8-30	18-30	1.30-1.50	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.15	.17			
	30-60	5-30	1.40-1.60	0.60-6.00	0.06-0.10	0.0-2.9	0.0-0.5	.15	.20			
EkA:												
Elk------------------	0-10	10-27	1.20-1.40	0.60-2.00	0.19-0.23	0.0-2.9	0.5-3.0	.37	.37	5	5	56
	10-48	18-34	1.20-1.50	0.60-2.00	0.18-0.22	0.0-2.9	0.5-1.0	.28	.28			
	48-60	15-40	1.20-1.50	0.60-2.00	0.14-0.20	0.0-2.9	0.0-0.5	.28	.32			
EkB:												
Elk------------------	0-10	10-27	1.20-1.40	0.60-2.00	0.19-0.23	0.0-2.9	0.5-3.0	.37	.37	5	5	56
	10-48	18-34	1.20-1.50	0.60-2.00	0.18-0.22	0.0-2.9	0.5-1.0	.28	.28			
	48-60	15-40	1.20-1.50	0.60-2.00	0.14-0.20	0.0-2.9	0.0-0.5	.28	.32			
GbB:												
Glenelg--------------	0-8	15-25	1.10-1.40	0.60-2.00	0.14-0.17	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	8-29	20-32	1.20-1.60	0.60-2.00	0.14-0.20	0.0-2.9	0.0-0.5	.43	.49			
	29-50	5-20	1.20-1.40	0.60-2.00	0.10-0.20	0.0-2.9	0.0-0.5	.49	.55			
GbC:												
Glenelg--------------	0-8	15-25	1.10-1.40	0.60-2.00	0.14-0.17	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	8-29	20-32	1.20-1.60	0.60-2.00	0.14-0.20	0.0-2.9	0.0-0.5	.43	.49			
	29-50	5-20	1.20-1.40	0.60-2.00	0.10-0.20	0.0-2.9	0.0-0.5	.49	.55			

See footnote at end of table.

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
GbD:												
Glenelg---------------	0-8	15-25	1.10-1.40	0.60-2.00	0.14-0.17	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	8-29	20-32	1.20-1.60	0.60-2.00	0.14-0.20	0.0-2.9	0.0-0.5	.43	.49			
	29-50	5-20	1.20-1.40	0.60-2.00	0.10-0.20	0.0-2.9	0.0-0.5	.49	.55			
GdA:												
Glenville-------------	0-10	10-20	1.20-1.40	0.60-2.00	0.16-0.20	0.0-2.9	2.0-4.0	.32	.32	3	5	56
	10-19	20-35	1.40-1.60	0.60-2.00	0.12-0.16	0.0-2.9	0.0-0.5	.24	.28			
	19-40	20-35	1.60-1.80	0.06-0.60	0.08-0.12	0.0-2.9	0.0-0.5	.24	.28			
	40-60	5-25	1.40-1.60	0.20-0.60	0.06-0.12	0.0-2.9	0.0-0.5	.24	.32			
GdB:												
Glenville-------------	0-10	10-20	1.20-1.40	0.60-2.00	0.16-0.20	0.0-2.9	2.0-4.0	.32	.32	3	5	56
	10-19	20-35	1.40-1.60	0.60-2.00	0.12-0.16	0.0-2.9	0.0-0.5	.24	.28			
	19-40	20-35	1.60-1.80	0.06-0.60	0.08-0.12	0.0-2.9	0.0-0.5	.24	.28			
	40-60	5-25	1.40-1.60	0.20-0.60	0.06-0.12	0.0-2.9	0.0-0.5	.24	.32			
HaA:												
Hagerstown------------	0-10	15-35	1.20-1.40	0.60-6.00	0.16-0.24	0.0-2.9	1.0-5.0	.32	.32	4	6	48
	10-60	35-60	1.20-1.60	0.60-2.00	0.10-0.24	3.0-5.9	0.0-0.5	.28	.28			
HaB:												
Hagerstown------------	0-10	15-35	1.20-1.40	0.60-6.00	0.16-0.24	0.0-2.9	1.0-5.0	.32	.32	4	6	48
	10-60	35-60	1.20-1.60	0.60-2.00	0.10-0.24	3.0-5.9	0.0-0.5	.28	.28			
HaC:												
Hagerstown------------	0-10	15-35	1.20-1.40	0.60-6.00	0.16-0.24	0.0-2.9	1.0-5.0	.32	.32	4	6	48
	10-60	35-60	1.20-1.60	0.60-2.00	0.10-0.24	3.0-5.9	0.0-0.5	.28	.28			
Hc:												
Hatboro---------------	0-12	10-20	1.20-1.40	0.60-2.00	0.16-0.22	0.0-2.9	2.0-4.0	.37	.37	5	5	56
	12-45	15-35	1.20-1.40	0.60-2.00	0.16-0.20	0.0-2.9	0.0-0.5	.20	.20			
	45-60	5-45	1.10-1.60	2.00-6.00	0.04-0.08	0.0-2.9	0.0-0.5	---	---			
HgB:												
Highfield-------------	0-12	10-20	1.20-1.40	0.60-2.00	0.12-0.16	0.0-2.9	1.0-3.0	.28	.37	3	6	48
	12-38	15-27	1.40-1.60	0.60-2.00	0.10-0.14	0.0-2.9	0.0-0.5	.28	.32			
	38-42	15-27	1.40-1.60	0.60-2.00	0.06-0.10	0.0-2.9	0.0-0.5	.28	.37			
	42-52	---	2.25-2.35	0.06-0.20	0.00-0.00	---	---	---	---			
HgC:												
Highfield-------------	0-12	10-20	1.20-1.40	0.60-2.00	0.12-0.16	0.0-2.9	1.0-3.0	.28	.37	3	6	48
	12-38	15-27	1.40-1.60	0.60-2.00	0.10-0.14	0.0-2.9	0.0-0.5	.28	.32			
	38-42	15-27	1.40-1.60	0.60-2.00	0.06-0.10	0.0-2.9	0.0-0.5	.28	.37			
	42-52	---	2.25-2.35	0.06-0.20	0.00-0.00	---	---	---	---			
HHD:												
Highfield-------------	0-12	10-20	1.20-1.40	0.60-2.00	0.12-0.16	0.0-2.9	1.0-3.0	.28	.37	3	6	48
	12-38	15-27	1.40-1.60	0.60-2.00	0.10-0.14	0.0-2.9	0.0-0.5	.28	.32			
	38-42	15-27	1.40-1.60	0.60-2.00	0.06-0.10	0.0-2.9	0.0-0.5	.28	.37			
	42-52	---	2.25-2.35	0.06-0.20	0.00-0.00	---	---	---	---			
Catoctin--------------	0-9	5-20	1.20-1.50	2.00-6.00	0.11-0.16	0.0-2.9	0.5-2.0	.17	.32	2	5	56
	9-16	10-35	1.20-1.50	2.00-6.00	0.08-0.16	0.0-2.9	---	.17	.24			
	16-24	10-25	1.20-1.50	2.00-6.00	0.04-0.15	0.0-2.9	---	.17	.28			
	24-34	---	---	0.00-0.06	---	---	---	---	---			

See footnote at end of table.

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
HKD:												
Highfield-------------	0-12	10-20	1.20-1.40	0.60-2.00	0.12-0.18	0.0-2.9	---	.28	.37	3	8	0
	12-38	15-27	1.40-1.60	0.60-2.00	0.10-0.14	0.0-2.9	---	.28	.32			
	38-42	15-27	1.40-1.60	0.60-2.00	0.06-0.10	0.0-2.9	---	.28	.37			
	42-52	---	---	0.06-2.00	---	---	---	---	---			
Catoctin--------------	0-9	5-20	1.20-1.50	2.00-6.00	0.08-0.14	0.0-2.9	0.5-2.0	.20	.32	2	8	0
	9-16	10-35	1.20-1.50	2.00-6.00	0.08-0.16	0.0-2.9	0.0-0.5	.17	.24			
	16-24	10-25	1.20-1.50	2.00-6.00	0.04-0.15	0.0-2.9	0.0-0.5	.17	.28			
	24-34	---	---	0.00-0.06	---	---	---	---	---			
Myersville------------	0-9	5-20	1.20-1.50	2.00-6.00	0.11-0.16	0.0-2.9	0.5-2.0	.28	.37	4	8	0
	9-38	18-35	1.20-1.50	0.60-2.00	0.14-0.18	0.0-2.9	0.0-0.5	.32	.37			
	38-48	10-32	1.20-1.50	0.60-2.00	0.08-0.16	0.0-2.9	0.0-0.5	.32	.43			
	48-60	---	---	0.00-0.06	---	---	---	---	---			
	60-70	---	---	0.00-0.06	---	---	---	---	---			
KnD:												
Klinesville-----------	0-8	10-25	1.20-1.40	2.00-6.00	0.08-0.12	0.0-2.9	0.5-2.0	.20	.28	2	6	48
	8-14	10-20	1.40-1.60	2.00-6.00	0.06-0.10	0.0-2.9	---	.20	.28			
	14-16	10-20	1.40-1.60	2.00-6.00	0.04-0.08	0.0-2.9	---	.20	.28			
	16-26	---	---	0.20-2.00	0.00-0.00	---	---	---	---			
KnE:												
Klinesville-----------	0-8	10-25	1.20-1.40	2.00-6.00	0.08-0.12	0.0-2.9	0.5-2.0	.20	.28	2	6	48
	8-14	10-20	1.40-1.60	2.00-6.00	0.06-0.10	0.0-2.9	---	.20	.28			
	14-16	10-20	1.40-1.60	2.00-6.00	0.04-0.08	0.0-2.9	---	.20	.28			
	16-26	---	---	0.20-2.00	0.00-0.00	---	---	---	---			
Lc:												
Lamington-------------	0-11	10-25	1.20-1.40	0.60-2.00	0.14-0.18	0.0-2.9	2.0-4.0	.32	.32	3	5	56
	11-17	18-35	1.40-1.60	0.60-2.00	0.12-0.18	0.0-2.9	0.0-0.5	.37	.37			
	17-46	18-35	1.60-1.80	0.06-0.20	0.08-0.12	0.0-2.9	0.0-0.5	.24	.28			
	46-60	5-30	1.46-1.60	0.60-20.00	0.06-0.10	0.0-2.9	0.0-0.5	.24	.32			
LeB:												
Lansdale--------------	0-10	5-15	1.25-1.35	0.60-2.00	0.12-0.18	0.0-2.9	2.0-4.0	.32	.32	4	5	56
	10-30	10-25	1.35-1.45	0.60-6.00	0.09-0.16	0.0-2.9	0.5-1.0	.28	.32			
	30-47	10-18	1.40-1.55	2.00-6.00	0.07-0.10	0.0-2.9	0.0-0.5	.28	.32			
	47-57	---	---	0.20-0.60	---	---	---	---	---			
LfC:												
Lansdale--------------	0-10	5-15	1.30-1.40	0.60-2.00	0.10-0.16	0.0-2.9	2.0-4.0	.28	.32	4	5	56
	10-30	10-25	1.35-1.45	0.60-6.00	0.09-0.16	0.0-2.9	0.5-1.0	.28	.32			
	30-47	10-18	1.40-1.55	2.00-6.00	0.07-0.10	0.0-2.9	0.0-0.5	.28	.32			
	47-57	---	---	0.20-0.60	---	---	---	---	---			
LgB:												
Legore----------------	0-10	12-34	1.20-1.40	0.60-6.00	0.12-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	10-30	27-34	1.40-1.60	0.60-2.00	0.12-0.24	3.0-5.9	0.0-0.5	.17	.20			
	30-60	18-34	1.40-1.60	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.28	.32			
LgC:												
Legore----------------	0-10	12-34	1.20-1.40	0.60-6.00	0.10-0.24	0.0-2.9	1.0-3.0	.24	.32	5	6	48
	10-30	27-34	1.40-1.60	0.60-2.00	0.12-0.24	3.0-5.9	0.0-0.5	.17	.20			
	30-60	18-34	1.40-1.60	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.28	.32			

See footnote at end of table.

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
LgD:												
Legore----------------	0-10	12-34	1.20-1.40	0.60-6.00	0.10-0.24	0.0-2.9	1.0-3.0	.24	.32	5	6	48
	10-30	27-34	1.40-1.60	0.60-2.00	0.12-0.24	3.0-5.9	0.0-0.5	.17	.20			
	30-60	18-34	1.40-1.60	0.60-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.28	.32			
LhA:												
Lehigh----------------	0-8	10-20	1.30-1.40	0.60-2.00	0.14-0.20	0.0-2.9	2.0-3.0	.28	.37	3	6	48
	8-30	17-32	1.30-1.50	0.06-0.20	0.14-0.18	0.0-2.9	0.0-0.5	.28	.32			
	30-42	17-32	1.40-1.70	0.06-0.20	0.06-0.10	0.0-2.9	0.0-0.5	.28	.37			
	42-52	---	---	0.60-6.00	---	---	---	---	---			
LhB:												
Lehigh----------------	0-8	10-20	1.30-1.40	0.60-2.00	0.14-0.20	0.0-2.9	2.0-3.0	.28	.37	3	6	48
	8-30	17-32	1.30-1.50	0.06-0.20	0.14-0.18	0.0-2.9	0.0-0.5	.28	.32			
	30-42	17-32	1.40-1.70	0.06-0.20	0.06-0.10	0.0-2.9	0.0-0.5	.28	.37			
	42-52	---	---	0.60-6.00	---	---	---	---	---			
LhC:												
Lehigh----------------	0-8	10-20	1.30-1.40	0.60-2.00	0.14-0.20	0.0-2.9	2.0-3.0	.28	.37	3	6	48
	8-30	17-32	1.30-1.50	0.06-0.20	0.14-0.18	0.0-2.9	0.0-0.5	.28	.32			
	30-42	17-32	1.40-1.70	0.06-0.20	0.06-0.10	0.0-2.9	0.0-0.5	.28	.37			
	42-52	---	---	0.60-6.00	---	---	---	---	---			
LhD:												
Lehigh----------------	0-8	10-20	1.30-1.40	0.60-2.00	0.14-0.20	0.0-2.9	2.0-3.0	.28	.37	3	6	48
	8-30	17-32	1.30-1.50	0.06-0.20	0.14-0.18	0.0-2.9	0.0-0.5	.28	.32			
	30-42	17-32	1.40-1.70	0.06-0.20	0.06-0.10	0.0-2.9	0.0-0.5	.28	.37			
	42-52	---	---	0.60-6.00	---	---	---	---	---			
LkB:												
Lehigh----------------	0-8	10-20	1.20-1.40	0.60-2.00	0.14-0.22	0.0-2.9	2.0-3.0	.28	.37	3	8	0
	8-30	17-32	1.30-1.50	0.06-0.20	0.14-0.18	0.0-2.9	0.0-0.5	.28	.32			
	30-42	17-32	1.40-1.70	0.06-0.20	0.06-0.10	0.0-2.9	0.0-0.5	.28	.37			
	42-52	---	---	0.60-6.00	---	---	---	---	---			
LrB:												
Lewisberry------------	0-12	8-15	1.20-1.40	2.00-6.00	0.08-0.12	0.0-2.9	1.0-3.0	.15	.20	3	6	48
	12-46	10-18	1.40-1.60	2.00-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.15	.17			
	46-62	10-18	1.40-1.60	2.00-6.00	0.04-0.06	0.0-2.9	0.0-0.5	.15	.20			
	62-72	---	---	0.60-6.00	---	---	0.0-0.5	---	---			
LrC:												
Lewisberry------------	0-12	8-15	1.20-1.40	2.00-6.00	0.08-0.12	0.0-2.9	1.0-3.0	.15	.20	3	6	48
	12-46	10-18	1.40-1.60	2.00-6.00	0.08-0.12	0.0-2.9	0.0-0.5	.15	.17			
	46-62	10-18	1.40-1.60	2.00-6.00	0.04-0.06	0.0-2.9	0.0-0.5	.15	.20			
	62-72	---	---	0.60-6.00	---	---	0.0-0.5	---	---			
LSD:												
Lewisberry------------	0-12	8-15	1.20-1.40	2.00-6.00	0.08-0.14	0.0-2.9	---	.15	.20	3	8	0
	12-46	10-18	1.40-1.60	2.00-6.00	0.08-0.12	0.0-2.9	---	.15	.17			
	46-62	10-18	1.40-1.60	2.00-6.00	0.04-0.06	0.0-2.9	---	.15	.20			
	62-72	---	---	0.60-6.00	---	---	---	---	---			
Lansdale--------------	0-10	5-15	1.25-1.35	0.60-2.00	0.07-0.14	0.0-2.9	2.0-4.0	.24	.32	4	8	0
	10-30	10-25	1.40-1.50	0.60-6.00	0.10-0.15	0.0-2.9	0.5-1.0	.28	.32			
	30-47	5-15	1.40-1.50	2.00-6.00	0.07-0.10	0.0-2.9	0.0-0.5	.28	.37			
	47-57	---	---	0.20-0.60	---	---	---	---	---			

See footnote at end of table.

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
Lw:												
Lindside--------------	0-8	15-27	1.20-1.40	0.60-2.00	0.20-0.26	0.0-2.9	2.0-4.0	.32	.32	5	---	---
	8-31	18-35	1.20-1.40	0.20-2.00	0.17-0.22	0.0-2.9	0.0-0.5	.37	.37			
	31-60	18-35	1.20-1.40	0.20-6.00	0.12-0.18	0.0-2.9	0.0-0.5	.32	.32			
MdA:												
Mount Lucas-----------	0-8	10-20	1.20-1.30	0.60-2.00	0.18-0.22	0.0-2.9	1.0-2.0	.32	.32	4	5	56
	8-37	17-32	1.30-1.60	0.06-0.60	0.12-0.16	0.0-2.9	0.0-0.5	.28	.32			
	37-60	5-20	1.30-1.70	0.06-6.00	0.04-0.12	0.0-2.9	0.0-0.5	.28	.37			
MdB:												
Mount Lucas-----------	0-8	10-20	1.20-1.30	0.60-2.00	0.18-0.22	0.0-2.9	1.0-2.0	.32	.32	4	5	56
	8-37	17-32	1.30-1.60	0.06-0.60	0.12-0.16	0.0-2.9	0.0-0.5	.28	.32			
	37-60	5-20	1.30-1.70	0.06-6.00	0.04-0.12	0.0-2.9	0.0-0.5	.28	.37			
MeB:												
Mount Lucas-----------	0-9	10-20	1.20-1.30	0.60-2.00	0.16-0.22	0.0-2.9	2.0-4.0	.28	.32	3	8	0
	9-38	17-32	1.30-1.60	0.06-0.60	0.12-0.16	0.0-2.9	0.0-0.5	.28	.32			
	38-60	5-32	1.30-1.70	0.06-6.00	0.04-0.12	0.0-2.9	0.0-0.5	.28	.37			
MOB:												
Mt. Airy--------------	0-8	15-26	1.20-1.40	0.60-2.00	0.08-0.12	0.0-2.9	1.0-3.0	.28	.37	3	6	48
	8-32	15-30	1.20-1.40	0.60-6.00	0.05-0.09	0.0-2.9	---	.17	.24			
	32-42	---	---	0.01-0.05	---	---	---	---	---			
Manor-----------------	0-8	10-25	1.20-1.40	0.60-2.00	0.14-0.17	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	8-24	10-25	1.20-1.50	0.60-2.00	0.14-0.20	0.0-2.9	0.0-0.5	.32	.37			
	24-60	5-20	1.25-1.50	0.60-6.00	0.10-0.20	0.0-2.9	0.0-0.5	.49	.55			
MOC:												
Mt. Airy--------------	0-8	15-26	1.20-1.40	0.60-2.00	0.08-0.12	0.0-2.9	1.0-3.0	.28	.37	3	6	48
	8-32	15-30	1.20-1.40	0.60-6.00	0.05-0.09	0.0-2.9	---	.17	.24			
	32-42	---	---	0.01-0.05	---	---	---	---	---			
Manor-----------------	0-8	10-25	1.20-1.40	0.60-2.00	0.14-0.17	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	8-24	10-25	1.20-1.50	0.60-2.00	0.14-0.20	0.0-2.9	0.0-0.5	.32	.37			
	24-60	5-20	1.25-1.50	0.60-6.00	0.10-0.20	0.0-2.9	0.0-0.5	.49	.55			
MOD:												
Mt. Airy--------------	0-8	15-26	1.20-1.40	0.60-2.00	0.08-0.12	0.0-2.9	1.0-3.0	.28	.37	3	6	48
	8-32	15-30	1.20-1.40	0.60-6.00	0.05-0.09	0.0-2.9	---	.17	.24			
	32-42	---	---	0.01-0.05	---	---	---	---	---			
Manor-----------------	0-8	10-25	1.20-1.40	0.60-2.00	0.14-0.17	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	8-24	10-25	1.20-1.50	0.60-2.00	0.14-0.20	0.0-2.9	0.0-0.5	.32	.37			
	24-60	5-20	1.25-1.50	0.60-6.00	0.10-0.20	0.0-2.9	0.0-0.5	.49	.55			
MOE:												
Mt. Airy--------------	0-8	15-26	1.20-1.40	0.60-2.00	0.08-0.12	0.0-2.9	1.0-3.0	.28	.37	3	6	48
	8-32	15-30	1.20-1.40	0.60-6.00	0.05-0.09	0.0-2.9	---	.17	.24			
	32-42	---	---	0.01-0.05	---	---	---	---	---			
Manor-----------------	0-8	10-25	1.20-1.40	0.60-2.00	0.14-0.17	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	8-24	10-25	1.20-1.50	0.60-2.00	0.14-0.20	0.0-2.9	0.0-0.5	.32	.37			
	24-60	5-20	1.25-1.50	0.60-6.00	0.10-0.20	0.0-2.9	0.0-0.5	.49	.55			

See footnote at end of table.

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
MPD:												
Mt. Airy	0-8	15-26	1.20-1.40	0.60-2.00	0.08-0.12	0.0-2.9	1.0-3.0	.28	.37	3	6	48
	8-32	15-30	1.20-1.40	0.60-6.00	0.05-0.09	0.0-2.9	---	.17	.24			
	32-42	---	---	0.01-0.05	---	---	---	---	---			
Manor	0-8	10-25	1.10-1.45	0.60-2.00	0.14-0.17	0.0-2.9	1.0-3.0	.32	.37	5	5	56
	8-24	10-25	1.20-1.50	0.60-2.00	0.14-0.20	0.0-2.9	0.0-0.5	.32	.37			
	24-60	5-20	1.25-1.50	0.60-6.00	0.10-0.20	0.0-2.9	0.0-0.5	.49	.49			
MRF:												
Mt. Airy	0-8	15-26	1.20-1.40	0.60-2.00	0.08-0.12	0.0-2.9	1.0-3.0	.28	.37	3	6	48
	8-32	15-30	1.20-1.40	0.60-6.00	0.05-0.09	0.0-2.9	---	.17	.24			
	32-42	---	---	0.01-0.05	---	---	---	---	---			
Manor	0-8	10-25	1.10-1.45	0.60-2.00	0.14-0.17	0.0-2.9	1.0-3.0	.32	.37	5	5	56
	8-24	10-25	1.20-1.50	0.60-2.00	0.14-0.20	0.0-2.9	0.0-0.5	.32	.37			
	24-60	5-20	1.25-1.50	0.60-6.00	0.10-0.20	0.0-2.9	0.0-0.5	.49	.49			
MvB:												
Murrill	0-10	10-20	1.20-1.50	0.60-2.00	0.12-0.16	0.0-2.9	1.0-4.0	.28	.32	4	---	---
	10-36	18-35	1.40-1.70	0.60-2.00	0.10-0.14	0.0-2.9	0.0-0.5	.24	.28			
	36-86	27-55	1.40-1.70	0.20-2.00	0.08-0.12	3.0-5.9	0.0-0.5	.28	.32			
MvC:												
Murrill	0-10	10-20	1.20-1.50	0.60-2.00	0.12-0.16	0.0-2.9	1.0-4.0	.28	.32	4	---	---
	10-36	18-35	1.40-1.70	0.60-2.00	0.10-0.14	0.0-2.9	0.0-0.5	.24	.28			
	36-86	27-55	1.40-1.70	0.20-2.00	0.08-0.12	3.0-5.9	0.0-0.5	.28	.32			
NaB:												
Neshaminy	0-8	10-25	1.20-1.40	0.60-2.00	0.14-0.18	0.0-2.9	2.0-4.0	.28	.32	4	6	48
	8-70	20-40	1.40-1.60	0.20-0.60	0.10-0.14	0.0-2.9	0.0-0.5	.17	.20			
NaC:												
Neshaminy	0-8	10-25	1.20-1.40	0.60-2.00	0.14-0.18	0.0-2.9	2.0-4.0	.28	.32	4	6	48
	8-70	20-40	1.40-1.60	0.20-0.60	0.10-0.14	0.0-2.9	0.0-0.5	.17	.20			
NdB:												
Neshaminy	0-8	10-25	1.20-1.40	0.60-2.00	0.12-0.20	0.0-2.9	3.0-5.0	.24	.32	4	8	0
	8-70	20-40	1.40-1.60	0.20-0.60	0.10-0.14	0.0-2.9	0.0-0.5	.17	.20			
NdD:												
Neshaminy	0-8	10-25	1.20-1.40	0.60-2.00	0.12-0.20	0.0-2.9	3.0-5.0	.24	.32	4	8	0
	8-70	20-40	1.40-1.60	0.20-0.60	0.10-0.14	0.0-2.9	0.0-0.5	.17	.20			
NdE:												
Neshaminy	0-8	10-25	1.20-1.40	0.60-2.00	0.12-0.20	0.0-2.9	3.0-5.0	.24	.32	4	8	0
	8-70	20-40	1.40-1.60	0.20-0.60	0.10-0.14	0.0-2.9	0.0-0.5	.17	.20			
Pa:												
Penlaw	0-10	15-25	1.10-1.40	0.60-2.00	0.16-0.20	0.0-2.9	2.0-4.0	.43	.43	3	5	56
	10-20	20-35	1.20-1.60	0.60-2.00	0.16-0.20	3.0-5.9	0.0-0.5	.24	.24			
	20-47	20-35	1.30-1.90	0.06-0.20	0.10-0.16	3.0-5.9	0.0-0.5	.24	.24			
	47-60	15-50	1.20-1.80	0.06-0.60	0.12-0.16	3.0-5.9	0.0-0.5	.24	.28			
PbB:												
Penn	0-9	10-20	1.20-1.40	0.60-6.00	0.14-0.20	0.0-2.9	2.0-4.0	.24	.32	3	8	0
	9-30	18-25	1.40-1.60	0.60-6.00	0.14-0.18	0.0-2.9	0.0-0.5	.24	.28			
	30-38	18-25	1.40-1.60	0.60-6.00	0.04-0.08	0.0-2.9	0.0-0.5	.24	.28			
	38-48	---	---	0.20-6.00	---	---	---	---	---			

See footnote at end of table.

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
PbD:												
Penn------------------	0-9	10-20	1.20-1.40	0.60-6.00	0.14-0.20	0.0-2.9	2.0-4.0	.24	.32	3	8	0
	9-30	18-25	1.40-1.60	0.60-6.00	0.14-0.18	0.0-2.9	0.0-0.5	.24	.28			
	30-38	18-25	1.40-1.60	0.60-6.00	0.04-0.08	0.0-2.9	0.0-0.5	.24	.28			
	38-48	---	---	0.20-6.00	---	---	---	---	---			
PcF:												
Penn------------------	0-9	10-20	1.20-1.40	0.60-6.00	0.14-0.20	0.0-2.9	2.0-4.0	.24	.32	3	8	0
	9-30	18-25	1.40-1.60	0.60-6.00	0.14-0.18	0.0-2.9	0.0-0.5	.24	.28			
	30-38	18-25	1.40-1.60	0.60-6.00	0.04-0.08	0.0-2.9	0.0-0.5	.24	.28			
	38-48	---	---	0.20-6.00	---	---	---	---	---			
PeB:												
Penn------------------	0-9	10-20	1.20-1.40	0.60-6.00	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	3	5	56
	9-30	18-32	1.40-1.60	0.60-6.00	0.14-0.18	0.0-2.9	0.0-0.5	.24	.28			
	30-38	18-25	1.40-1.60	0.60-6.00	0.04-0.08	0.0-2.9	0.0-0.5	.24	.28			
	38-48	---	---	0.20-6.00	---	---	---	---	---			
PeC:												
Penn------------------	0-9	10-20	1.20-1.40	0.60-6.00	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	3	5	56
	9-30	18-32	1.40-1.60	0.60-6.00	0.14-0.18	0.0-2.9	0.0-0.5	.24	.28			
	30-38	18-25	1.40-1.60	0.60-6.00	0.04-0.08	0.0-2.9	0.0-0.5	.24	.28			
	38-48	---	---	0.20-6.00	---	---	---	---	---			
PoB:												
Penn------------------	0-9	10-20	1.20-1.40	0.60-6.00	0.14-0.18	0.0-2.9	1.0-3.0	.28	.32	3	6	48
	9-30	18-32	1.40-1.60	0.60-6.00	0.14-0.18	0.0-2.9	0.0-0.5	.24	.28			
	30-38	18-25	1.40-1.60	0.60-6.00	0.04-0.08	0.0-2.9	0.0-0.5	.24	.28			
	38-48	---	---	0.20-6.00	---	---	---	---	---			
Klinesville-----------	0-8	10-25	1.20-1.40	2.00-6.00	0.08-0.12	0.0-2.9	0.5-2.0	.20	.28	2	6	48
	8-14	10-20	1.40-1.60	2.00-6.00	0.06-0.10	0.0-2.9	---	.20	.28			
	14-16	10-20	1.40-1.60	2.00-6.00	0.04-0.08	0.0-2.9	---	.20	.28			
	16-26	---	---	0.20-2.00	0.00-0.00	---	---	---	---			
PoC:												
Penn------------------	0-9	10-20	1.20-1.40	0.60-6.00	0.14-0.18	0.0-2.9	1.0-3.0	.28	.32	3	6	48
	9-30	18-32	1.40-1.60	0.60-6.00	0.14-0.18	0.0-2.9	0.0-0.5	.24	.28			
	30-38	18-25	1.40-1.60	0.60-6.00	0.04-0.08	0.0-2.9	0.0-0.5	.24	.28			
	38-48	---	---	0.20-6.00	---	---	---	---	---			
Klinesville-----------	0-8	10-25	1.20-1.40	2.00-6.00	0.08-0.12	0.0-2.9	0.5-2.0	.20	.28	2	6	48
	8-14	10-20	1.40-1.60	2.00-6.00	0.06-0.10	0.0-2.9	---	.20	.28			
	14-16	10-20	1.40-1.60	2.00-6.00	0.04-0.08	0.0-2.9	---	.20	.28			
	16-26	---	---	0.20-2.00	0.00-0.00	---	---	---	---			
PpB:												
Penn------------------	0-9	10-20	1.20-1.40	0.60-6.00	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	3	5	56
	9-30	18-32	1.40-1.60	0.60-6.00	0.14-0.18	0.0-2.9	0.0-0.5	.24	.28			
	30-38	18-25	1.40-1.60	0.60-6.00	0.04-0.08	0.0-2.9	0.0-0.5	.24	.28			
	38-48	---	---	0.20-6.00	---	---	---	---	---			
Lansdale--------------	0-10	5-15	1.25-1.35	0.60-2.00	0.12-0.18	0.0-2.9	2.0-4.0	.32	.32	4	5	56
	10-30	10-25	1.35-1.45	0.60-6.00	0.09-0.16	0.0-2.9	0.5-1.0	.28	.32			
	30-47	10-18	1.40-1.55	2.00-6.00	0.07-0.10	0.0-2.9	0.0-0.5	.28	.32			
	47-57	---	---	0.20-0.60	---	---	---	---	---			

See footnote at end of table.

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors K	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
PpC:												
Penn------------------	0-9	10-20	1.20-1.40	0.60-6.00	0.14-0.18	0.0-2.9	1.0-3.0	.28	.32	3	6	48
	9-30	18-32	1.40-1.60	0.60-6.00	0.14-0.18	0.0-2.9	0.0-0.5	.24	.28			
	30-38	18-25	1.40-1.60	0.60-6.00	0.04-0.08	0.0-2.9	0.0-0.5	.24	.28			
	38-48	---	---	0.20-6.00	---	---	---	---	---			
Lansdale--------------	0-10	5-15	1.30-1.40	0.60-2.00	0.10-0.16	0.0-2.9	2.0-4.0	.28	.32	4	5	56
	10-30	10-25	1.35-1.45	0.60-6.00	0.09-0.16	0.0-2.9	0.5-1.0	.28	.32			
	30-47	10-18	1.40-1.55	2.00-6.00	0.07-0.10	0.0-2.9	0.0-0.5	.28	.32			
	47-57	---	---	0.20-0.60	---	---	---	---	---			
PsB:												
Pequea----------------	0-8	10-20	1.10-1.40	0.60-6.00	0.12-0.18	0.0-2.9	1.0-3.0	.43	.43	3	5	56
	8-24	10-20	1.20-1.50	0.60-6.00	0.10-0.14	0.0-2.9	---	.28	.32			
	24-60	10-20	1.20-1.50	0.60-6.00	0.06-0.12	0.0-2.9	---	.28	.32			
	60-70	---	---	0.06-2.00	---	---	---	---	---			
PsC:												
Pequea----------------	0-8	10-20	1.10-1.40	0.60-6.00	0.12-0.18	0.0-2.9	1.0-3.0	.43	.43	3	5	56
	8-24	10-20	1.20-1.50	0.60-6.00	0.10-0.14	0.0-2.9	---	.28	.32			
	24-60	10-20	1.20-1.50	0.60-6.00	0.06-0.12	0.0-2.9	---	.28	.32			
	60-70	---	---	0.06-2.00	---	---	---	---	---			
PsD:												
Pequea----------------	0-8	10-20	1.10-1.40	0.60-6.00	0.12-0.18	0.0-2.9	1.0-3.0	.43	.43	3	5	56
	8-24	10-20	1.20-1.50	0.60-6.00	0.10-0.14	0.0-2.9	---	.28	.32			
	24-60	10-20	1.20-1.50	0.60-6.00	0.06-0.12	0.0-2.9	---	.28	.32			
	60-70	---	---	0.06-2.00	---	---	---	---	---			
Pt*:												
Pits, quarries.												
RaA:												
Raritan---------------	0-9	10-20	1.20-1.40	0.60-2.00	0.16-0.20	0.0-2.9	2.0-4.0	.37	.37	3	5	56
	9-26	18-34	1.40-1.60	0.60-2.00	0.12-0.16	0.0-2.9	0.0-0.5	.28	.28			
	26-54	18-34	1.40-1.60	0.20-0.60	0.08-0.12	0.0-2.9	0.0-0.5	.28	.28			
	54-60	5-15	1.40-1.60	0.60-6.00	0.06-0.10	0.0-2.9	0.0-0.5	.28	.32			
RaB:												
Raritan---------------	0-9	10-20	1.20-1.40	0.60-2.00	0.16-0.20	0.0-2.9	2.0-4.0	.37	.37	3	5	56
	9-26	18-34	1.40-1.60	0.60-2.00	0.12-0.16	0.0-2.9	0.0-0.5	.28	.28			
	26-54	18-34	1.40-1.60	0.20-0.60	0.08-0.12	0.0-2.9	0.0-0.5	.28	.28			
	54-60	5-15	1.40-1.60	0.60-6.00	0.06-0.10	0.0-2.9	0.0-0.5	.28	.32			
ReA:												
Readington------------	0-10	15-20	1.20-1.40	0.60-2.00	0.18-0.23	0.0-2.9	1.0-3.0	.43	.43	3	5	56
	10-27	18-35	1.40-1.60	0.60-2.00	0.08-0.14	0.0-2.9	0.0-0.5	.32	.32			
	27-46	20-30	1.60-1.80	0.20-0.60	0.06-0.10	0.0-2.9	0.0-0.5	.32	.37			
	46-56	---	---	0.20-2.00	---	---	---	---	---			
ReB:												
Readington------------	0-10	15-20	1.20-1.40	0.60-2.00	0.18-0.23	0.0-2.9	1.0-3.0	.43	.43	3	5	56
	10-27	18-35	1.40-1.60	0.60-2.00	0.08-0.14	0.0-2.9	0.0-0.5	.32	.32			
	27-46	20-30	1.60-1.80	0.20-0.60	0.06-0.10	0.0-2.9	0.0-0.5	.32	.37			
	46-56	---	---	0.20-2.00	---	---	---	---	---			

See footnote at end of table.

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
RfB:												
Reaville--------------	0-9	15-22	1.20-1.40	0.60-2.00	0.14-0.18	0.0-2.9	2.0-3.0	.32	.43	2	6	48
	9-15	18-32	1.30-1.60	0.06-0.20	0.08-0.14	0.0-2.9	0.0-0.5	.28	.32			
	15-25	15-32	1.30-1.70	0.06-0.20	0.06-0.12	0.0-2.9	0.0-0.5	.28	.37			
	25-35	---	---	0.06-2.00	---	---	---	---	---			
RfC:												
Reaville--------------	0-9	15-22	1.20-1.40	0.60-2.00	0.14-0.18	0.0-2.9	2.0-3.0	.32	.43	2	6	48
	9-15	18-32	1.30-1.60	0.06-0.20	0.08-0.14	0.0-2.9	0.0-0.5	.28	.32			
	15-25	15-32	1.30-1.70	0.06-0.20	0.06-0.12	0.0-2.9	0.0-0.5	.28	.37			
	25-35	---	---	0.06-2.00	---	---	---	---	---			
Rw:												
Rowland---------------	0-10	10-20	1.10-1.30	0.20-2.00	0.14-0.18	0.0-2.9	2.0-4.0	.43	.43	4	5	56
	10-28	15-32	1.20-1.50	0.20-2.00	0.14-0.18	0.0-2.9	0.5-1.0	.28	.28			
	28-44	15-32	1.20-1.50	0.20-2.00	0.12-0.16	0.0-2.9	0.5-1.0	.28	.28			
	44-60	3-12	1.40-1.70	2.00-6.00	0.03-0.08	0.0-2.9	0.5-1.0	.17	.17			
StC:												
Steinsburg------------	0-10	10-20	1.20-1.40	2.00-6.00	0.10-0.14	0.0-2.9	1.0-3.0	.20	.28	2	6	48
	10-20	10-20	1.20-1.40	2.00-6.00	0.10-0.16	0.0-2.9	0.0-0.5	.20	.24			
	20-26	5-18	1.10-1.40	2.00-6.00	0.04-0.08	0.0-2.9	0.0-0.5	.20	.28			
	26-36	---	---	0.60-6.00	---	---	---	---	---			
StD:												
Steinsburg------------	0-10	10-20	1.20-1.40	2.00-6.00	0.10-0.14	0.0-2.9	1.0-3.0	.20	.28	2	6	48
	10-20	10-20	1.20-1.40	2.00-6.00	0.10-0.16	0.0-2.9	0.0-0.5	.20	.24			
	20-26	5-18	1.10-1.40	2.00-6.00	0.04-0.08	0.0-2.9	0.0-0.5	.20	.28			
	26-36	---	---	0.60-6.00	---	---	---	---	---			
Uc*:												
Urban land------------	0-6	---	---	---	0.00-0.00	---	---	---	---	-	---	---
UdB*:												
Urban land------------	0-6	---	---	---	0.00-0.00	---	---	---	---	-	---	---
Chester---------------	0-11	10-23	1.10-1.30	0.60-2.00	0.12-0.16	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	11-36	18-35	1.20-1.50	0.60-2.00	0.10-0.14	0.0-2.9	0.0-0.5	.43	.43			
	36-60	10-24	1.40-1.60	0.60-2.00	0.08-0.12	0.0-2.9	0.0-0.5	.49	.49			
UeB*:												
Urban land------------	0-6	---	---	---	0.00-0.00	---	---	---	---	-	---	---
Conestoga-------------	0-9	15-25	1.20-1.40	0.60-2.00	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	4	5	56
	9-40	22-35	1.40-1.60	0.60-2.00	0.12-0.16	0.0-2.9	---	.24	.24			
	40-60	22-35	1.40-1.60	0.60-2.00	0.06-0.10	0.0-2.9	---	.24	.28			
UfC*:												
Urban land------------	0-6	---	---	---	0.00-0.00	---	---	---	---	-	---	---
Mt. Airy--------------	0-8	15-26	1.20-1.40	0.60-2.00	0.08-0.12	0.0-2.9	1.0-3.0	.28	.37	3	6	48
	8-32	15-30	1.20-1.40	0.60-6.00	0.05-0.09	0.0-2.9	---	.17	.24			
	32-42	---	---	0.01-0.05	---	---	---	---	---			
UgB*:												
Urban land------------	0-6	---	---	---	0.00-0.00	---	---	---	---	-	---	---

See footnote at end of table.

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
UgB*:												
Penn	0-9	10-20	1.20-1.40	0.60-6.00	0.16-0.20	0.0-2.9	1.0-3.0	.32	.32	3	5	56
	9-30	18-32	1.40-1.60	0.60-6.00	0.14-0.18	0.0-2.9	0.0-0.5	.24	.28			
	30-38	18-25	1.40-1.60	0.60-6.00	0.04-0.08	0.0-2.9	0.0-0.5	.24	.28			
	38-48	---	---	0.20-6.00	---	---	---	---	---			
WaA:												
Watchung	0-9	15-40	1.20-1.40	0.20-2.00	0.14-0.21	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	9-40	40-65	1.20-1.50	0.00-0.20	0.10-0.21	3.0-5.9	0.0-0.5	.37	.37			
	40-60	15-40	1.20-1.50	0.20-2.00	0.12-0.21	3.0-5.9	0.0-0.5	.37	.37			
WaB:												
Watchung	0-9	15-40	1.20-1.40	0.20-2.00	0.14-0.21	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	9-40	40-65	1.20-1.50	0.00-0.20	0.10-0.21	3.0-5.9	0.0-0.5	.37	.37			
	40-60	15-40	1.20-1.50	0.20-2.00	0.12-0.21	3.0-5.9	0.0-0.5	.37	.37			
WbB:												
Watchung	0-9	15-40	1.20-1.40	0.20-2.00	0.14-0.28	0.0-2.9	---	.43	.43	3	8	0
	9-40	40-65	1.20-1.50	0.00-0.20	0.10-0.24	3.0-5.9	---	.37	.37			
	40-60	15-40	1.20-1.50	0.20-2.00	0.12-0.24	3.0-5.9	---	.37	.37			

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 18.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
ArB:			
Arendtsville-----------	0-9	5.0-12	3.6-6.0
	9-53	5.0-10	3.6-5.5
	53-68	5.0-10	3.6-5.5
ArC:			
Arendtsville-----------	0-9	5.0-12	3.6-6.0
	9-53	5.0-10	3.6-5.5
	53-68	5.0-10	3.6-5.5
ArD:			
Arendtsville-----------	0-9	5.0-12	3.6-6.0
	9-53	5.0-10	3.6-5.5
	53-68	5.0-10	3.6-5.5
AtB:			
Athol------------------	0-10	12-16	4.5-5.5
	10-52	8.0-13	5.1-6.5
	52-60	10-12	5.1-6.5
AtC:			
Athol------------------	0-10	12-16	4.5-5.5
	10-52	8.0-13	5.1-6.5
	52-60	10-12	5.1-6.5
Ba:			
Baile------------------	0-12	10-15	3.6-5.5
	12-44	10-15	3.6-5.5
	44-60	5-10	3.6-5.5
Be:			
Bermudian--------------	0-8	10-20	4.5-6.0
	8-50	10-20	4.5-6.0
	50-60	5-10	4.5-6.0
BgA:			
Birdsboro--------------	0-10	5.0-15	3.6-5.5
	10-60	5.0-15	3.6-5.5
BgB:			
Birdsboro--------------	0-10	5.0-15	3.6-5.5
	10-60	5.0-15	3.6-5.5
BgC:			
Birdsboro--------------	0-10	5.0-15	3.6-5.5
	10-60	5.0-15	3.6-5.5
Bo:			
Bowmansville-----------	0-11	10-20	5.1-6.5
	11-34	10-20	5.1-6.5
	34-60	5.0-15	5.1-7.3
BrB:			
Brecknock--------------	0-7	10-20	4.5-6.5
	7-30	10-25	4.5-6.5
	30-42	10-25	4.5-6.5
	42-52	---	---

See footnote at end of table.

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
BrC:			
Brecknock	0-7	10-20	4.5-6.5
	7-30	10-25	4.5-6.5
	30-42	10-25	4.5-6.5
	42-52	---	---
BrD:			
Brecknock	0-7	10-20	4.5-6.5
	7-30	10-25	4.5-6.5
	30-42	10-25	4.5-6.5
	42-52	---	---
BsD:			
Brecknock	0-7	10-20	4.5-6.5
	7-30	10-25	4.5-6.5
	30-42	10-25	4.5-6.5
	42-52	---	---
BsF:			
Brecknock	0-7	10-20	4.5-6.5
	7-30	10-25	4.5-6.5
	30-42	10-25	4.5-6.5
	42-52	---	---
CcC:			
Catoctin	0-9	10-20	5.1-6.5
	9-16	5-15	5.1-6.5
	16-24	5-15	5.6-7.3
	24-34	5-15	---
Cd:			
Chagrin	0-10	10-15	5.6-7.3
	10-36	10-15	5.6-7.3
	36-60	5-10	5.6-7.3
CeB:			
Chester	0-11	5-15	4.5-5.5
	11-36	5-15	4.5-5.5
	36-60	5-15	4.5-5.5
CeC:			
Chester	0-11	5-15	4.5-5.5
	11-36	5-15	4.5-5.5
	36-60	5-15	4.5-5.5
CkA:			
Clarksburg	0-8	12-20	5.1-6.5
	8-32	12-25	5.1-6.5
	32-54	12-25	5.1-6.5
	54-64	15-28	5.1-6.5
CkB:			
Clarksburg	0-8	12-20	5.1-6.5
	8-32	12-25	5.1-6.5
	32-54	12-25	5.1-6.5
	54-64	15-28	5.1-6.5

See footnote at end of table.

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
Cm:			
Codorus	0-12	15-25	4.5-6.0
	12-48	15-25	5.1-6.5
	48-60	15-25	5.1-6.5
CnA:			
Conestoga	0-9	15-25	4.5-7.3
	9-40	8-15	4.5-7.3
	40-60	5-15	5.6-7.8
CnB:			
Conestoga	0-9	15-25	4.5-7.3
	9-40	8-15	4.5-7.3
	40-60	5-15	5.6-7.8
CnC:			
Conestoga	0-9	15-25	4.5-7.3
	9-40	8-15	4.5-7.3
	40-60	5-15	5.6-7.8
CrA:			
Croton	0-12	15-25	4.5-5.5
	12-20	9.0-16	4.5-6.0
	20-37	8.0-12	4.5-6.0
	37-42	8.0-12	4.5-6.0
	42-52	---	---
CrB:			
Croton	0-12	15-25	4.5-5.5
	12-20	9.0-16	4.5-6.0
	20-37	8.0-12	4.5-6.0
	37-42	8.0-12	4.5-6.0
	42-52	---	---
DuA:			
Duffield	0-10	15-20	5.1-7.3
	10-50	10-25	5.1-7.3
	50-60	10-25	5.1-6.5
DuB:			
Duffield	0-10	15-20	5.1-7.3
	10-50	10-25	5.1-7.3
	50-60	10-25	5.1-6.5
DuC:			
Duffield	0-10	15-20	5.1-7.3
	10-50	10-25	5.1-7.3
	50-60	10-25	5.1-6.5
DWD:			
Duffield	0-10	15-20	5.1-7.3
	10-50	10-25	5.1-7.3
	50-60	10-25	5.1-6.5
Hagerstown	0-10	15-30	4.5-6.5
	10-18	15-30	4.5-7.3
	18-62	15-35	5.1-7.3

See footnote at end of table.

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
Dx*:			
Dumps, refuse.			
EdB:			
Edgemont	0-8	10-15	3.6-5.5
	8-30	8.0-16	3.6-5.5
	30-60	11-14	3.6-5.5
EdC:			
Edgemont	0-8	10-15	3.6-5.5
	8-30	8.0-16	3.6-5.5
	30-60	11-14	3.6-5.5
EdD:			
Edgemont	0-8	10-15	3.6-5.5
	8-30	8.0-16	3.6-5.5
	30-60	11-14	3.6-5.5
EeB:			
Edgemont	0-8	10-15	3.6-5.5
	8-30	8.0-16	3.6-5.5
	30-60	11-14	3.6-5.5
EeD:			
Edgemont	0-8	10-15	3.6-5.5
	8-30	8.0-16	3.6-5.5
	30-60	11-14	3.6-5.5
EeF:			
Edgemont	0-8	10-15	3.6-5.5
	8-30	8.0-16	3.6-5.5
	30-60	11-14	3.6-5.5
EkA:			
Elk	0-10	5.0-15	4.5-6.5
	10-48	5.0-20	4.5-6.5
	48-60	5.0-25	4.5-6.5
EkB:			
Elk	0-10	5.0-15	4.5-6.5
	10-48	5.0-20	4.5-6.5
	48-60	5.0-25	4.5-6.5
GbB:			
Glenelg	0-8	10-20	4.5-5.5
	8-29	5-10	4.5-6.5
	29-50	5-10	4.5-6.5
GbC:			
Glenelg	0-8	10-20	4.5-5.5
	8-29	5-10	4.5-6.5
	29-50	5-10	4.5-6.5
GbD:			
Glenelg	0-8	10-20	4.5-5.5
	8-29	5-10	4.5-6.5
	29-50	5-10	4.5-6.5

See footnote at end of table.

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
GdA:			
Glenville	0-10	10-20	4.5-7.3
	10-19	10-20	4.5-6.0
	19-40	10-20	4.5-6.0
	40-60	10-20	4.5-5.5
GdB:			
Glenville	0-10	10-20	4.5-7.3
	10-19	10-20	4.5-6.0
	19-40	10-20	4.5-6.0
	40-60	10-20	4.5-5.5
HaA:			
Hagerstown	0-10	15-30	4.5-6.5
	10-60	15-35	5.1-7.3
HaB:			
Hagerstown	0-10	15-30	4.5-6.5
	10-60	15-35	5.1-7.3
HaC:			
Hagerstown	0-10	15-30	4.5-6.5
	10-60	15-35	5.1-7.3
Hc:			
Hatboro	0-12	15-25	4.5-7.3
	12-45	15-25	4.5-7.3
	45-60	15-25	5.6-6.5
HgB:			
Highfield	0-12	10-20	4.5-5.5
	12-38	10-20	4.5-5.5
	38-42	10-20	5.1-6.0
	42-52	---	---
HgC:			
Highfield	0-12	10-20	4.5-5.5
	12-38	10-20	4.5-5.5
	38-42	10-20	5.1-6.0
	42-52	---	---
HHD:			
Highfield	0-12	10-20	4.5-5.5
	12-38	10-20	4.5-5.5
	38-42	10-20	5.1-6.0
	42-52	---	---
Catoctin	0-9	10-20	5.1-6.5
	9-16	5-15	5.1-6.5
	16-24	5-15	5.6-7.3
	24-34	3-8	---
HKD:			
Highfield	0-12	10-20	4.5-5.5
	12-38	10-20	4.5-5.5
	38-42	10-20	5.1-6.0
	42-52	---	---

See footnote at end of table.

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
HKD:			
Catoctin	0-9	10-20	5.1-6.5
	9-16	5-15	5.1-6.5
	16-24	5-15	5.6-7.3
	24-34	3-8	---
Myersville	0-9	15-25	4.5-6.0
	9-38	15-25	4.5-6.0
	38-48	5-15	4.5-6.0
	48-60	0-50	---
	60-70	---	---
KnD:			
Klinesville	0-8	10-22	4.5-6.0
	8-14	4.0-12	4.5-6.0
	14-16	4.0-12	4.5-6.0
	16-26	---	---
KnE:			
Klinesville	0-8	10-22	4.5-6.0
	8-14	4.0-12	4.5-6.0
	14-16	4.0-12	4.5-6.0
	16-26	---	---
Lc:			
Lamington	0-11	10-20	4.5-5.5
	11-17	10-20	4.5-5.5
	17-46	10-20	4.5-5.5
	46-60	10-20	4.5-5.5
LeB:			
Lansdale	0-10	8.0-16	4.5-5.0
	10-30	5.0-12	4.5-5.0
	30-47	4.0-8.0	4.5-5.0
	47-57	---	---
LfC:			
Lansdale	0-10	8.0-16	4.5-5.0
	10-30	5.0-12	4.5-5.0
	30-47	4.0-8.0	4.5-5.0
	47-57	---	---
LgB:			
Legore	0-10	15-25	5.1-6.0
	10-30	20-30	5.6-6.5
	30-60	20-30	5.6-6.5
LgC:			
Legore	0-10	15-25	5.1-6.0
	10-30	20-30	5.6-6.5
	30-60	20-30	5.6-6.5
LgD:			
Legore	0-10	15-25	5.1-6.0
	10-30	20-30	5.6-6.5
	30-60	20-30	5.6-6.5

See footnote at end of table.

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
LhA:			
Lehigh	0-8	10-20	4.5-7.3
	8-30	10-25	4.5-7.3
	30-42	10-25	4.5-7.3
	42-52	---	---
LhB:			
Lehigh	0-8	10-20	4.5-7.3
	8-30	10-25	4.5-7.3
	30-42	10-25	4.5-7.3
	42-52	---	---
LhC:			
Lehigh	0-8	10-20	4.5-7.3
	8-30	10-25	4.5-7.3
	30-42	10-25	4.5-7.3
	42-52	---	---
LhD:			
Lehigh	0-8	10-20	4.5-7.3
	8-30	10-25	4.5-7.3
	30-42	10-25	4.5-7.3
	42-52	---	---
LkB:			
Lehigh	0-8	10-20	5.1-6.0
	8-30	10-25	5.1-6.0
	30-42	10-25	5.1-6.0
	42-52	---	---
LrB:			
Lewisberry	0-12	10-22	4.5-6.0
	12-46	8.0-20	4.5-6.0
	46-62	8.0-20	4.5-6.5
	62-72	---	---
LrC:			
Lewisberry	0-12	10-22	4.5-6.0
	12-46	8.0-20	4.5-6.0
	46-62	8.0-20	4.5-6.5
	62-72	---	---
LSD:			
Lewisberry	0-12	10-22	4.5-5.5
	12-46	8.0-20	4.5-5.5
	46-62	8.0-20	4.5-6.0
	62-72	---	---
Lansdale	0-10	6.0-15	4.5-5.0
	10-30	5.0-12	4.5-5.0
	30-47	2.0-6.0	4.5-5.0
	47-57	---	---
Lw:			
Lindside	0-8	15-30	5.1-7.8
	8-31	15-25	5.1-7.8
	31-60	8.0-25	5.6-7.8

See footnote at end of table.

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
MdA:			
Mount Lucas------------	0-8	10-20	5.1-6.5
	8-37	15-30	5.1-7.3
	37-60	15-30	5.6-7.3
MdB:			
Mount Lucas------------	0-8	10-20	5.1-6.5
	8-37	15-30	5.1-7.3
	37-60	15-30	5.6-7.3
MeB:			
Mount Lucas------------	0-9	10-20	5.1-6.5
	9-38	15-30	5.1-7.3
	38-60	15-30	5.6-7.3
MOB:			
Mt. Airy---------------	0-8	5-15	4.5-5.5
	8-32	2.0-8	4.5-5.5
	32-42	2.0-8	---
Manor------------------	0-8	12-20	3.6-6.0
	8-24	3-10	3.6-6.0
	24-60	3-10	3.6-6.0
MOC:			
Mt. Airy---------------	0-8	5-15	4.5-5.5
	8-32	2.0-8	4.5-5.5
	32-42	2.0-8	---
Manor------------------	0-8	12-20	3.6-6.0
	8-24	3-10	3.6-6.0
	24-60	3-10	3.6-6.0
MOD:			
Mt. Airy---------------	0-8	5-15	4.5-5.5
	8-32	2.0-8	4.5-5.5
	32-42	2.0-8	---
Manor------------------	0-8	12-20	3.6-6.0
	8-24	3-10	3.6-6.0
	24-60	3-10	3.6-6.0
MOE:			
Mt. Airy---------------	0-8	5-15	4.5-5.5
	8-32	2.0-8	4.5-5.5
	32-42	2.0-8	---
Manor------------------	0-8	12-20	3.6-6.0
	8-24	3-10	3.6-6.0
	24-60	3-10	3.6-6.0
MPD:			
Mt. Airy---------------	0-8	5-15	4.5-5.5
	8-32	2.0-8	4.5-5.5
	32-42	2.0-8	---
Manor------------------	0-8	12-20	3.6-6.0
	8-24	3-10	3.6-6.0
	24-60	3-10	3.6-6.0

See footnote at end of table.

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
MRF:			
Mt. Airy	0-8	5-15	4.5-5.5
	8-32	2.0-8	4.5-5.5
	32-42	2.0-8	---
Manor	0-8	12-20	3.6-6.0
	8-24	3-10	3.6-6.0
	24-60	3-10	3.6-6.0
MvB:			
Murrill	0-10	8.0-20	4.5-6.0
	10-36	10-20	4.5-6.0
	36-86	10-20	4.5-6.0
MvC:			
Murrill	0-10	8.0-20	4.5-6.0
	10-36	10-20	4.5-6.0
	36-86	10-20	4.5-6.0
NaB:			
Neshaminy	0-8	20-30	4.5-6.0
	8-70	20-30	5.1-6.5
NaC:			
Neshaminy	0-8	20-30	4.5-6.0
	8-70	20-30	5.1-6.5
NdB:			
Neshaminy	0-8	10-25	4.5-6.0
	8-70	10-25	5.1-6.5
NdD:			
Neshaminy	0-8	10-25	4.5-6.0
	8-70	10-25	5.1-6.5
NdE:			
Neshaminy	0-8	10-25	4.5-6.0
	8-70	10-25	5.1-6.5
Pa:			
Penlaw	0-10	12-20	5.6-7.3
	10-20	12-25	5.6-7.3
	20-47	12-25	5.6-7.3
	47-60	15-30	5.6-7.3
PbB:			
Penn	0-9	10-20	3.6-5.5
	9-30	8.0-16	3.6-6.0
	30-38	5.0-15	5.1-6.5
	38-48	---	---
PbD:			
Penn	0-9	10-20	3.6-5.5
	9-30	8.0-16	3.6-6.0
	30-38	5.0-15	5.1-6.5
	38-48	---	---

See footnote at end of table.

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
PcF:			
Penn	0-9	10-20	3.6-5.5
	9-30	8.0-16	3.6-6.0
	30-38	5.0-15	5.1-6.5
	38-48	---	---
PeB:			
Penn	0-9	10-20	3.6-5.5
	9-30	8.0-15	3.6-6.0
	30-38	5.0-15	5.1-6.5
	38-48	---	---
PeC:			
Penn	0-9	10-20	3.6-5.5
	9-30	8.0-15	3.6-6.0
	30-38	5.0-15	5.1-6.5
	38-48	---	---
PoB:			
Penn	0-9	10-20	3.6-5.5
	9-30	8.0-15	3.6-6.0
	30-38	5.0-15	5.1-6.5
	38-48	---	---
Klinesville	0-8	10-22	4.5-6.0
	8-14	4.0-12	4.5-6.0
	14-16	4.0-12	4.5-6.0
	16-26	---	---
PoC:			
Penn	0-9	10-20	3.6-5.5
	9-30	8.0-15	3.6-6.0
	30-38	5.0-15	5.1-6.5
	38-48	---	---
Klinesville	0-8	10-22	4.5-6.0
	8-14	4.0-12	4.5-6.0
	14-16	4.0-12	4.5-6.0
	16-26	---	---
PpB:			
Penn	0-9	10-20	3.6-5.5
	9-30	8.0-15	3.6-6.0
	30-38	5.0-15	5.1-6.5
	38-48	---	---
Lansdale	0-10	8.0-16	4.5-5.0
	10-30	5.0-12	4.5-5.0
	30-47	4.0-8.0	4.5-5.0
	47-57	---	---
PpC:			
Penn	0-9	10-20	3.6-5.5
	9-30	8.0-15	3.6-6.0
	30-38	5.0-15	5.1-6.5
	38-48	---	---

See footnote at end of table.

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
PpC:			
Lansdale	0-10	8.0-16	4.5-5.0
	10-30	5.0-12	4.5-5.0
	30-47	4.0-8.0	4.5-5.0
	47-57	---	---
PsB:			
Pequea	0-8	12-17	6.1-7.3
	8-24	5.0-15	6.1-7.3
	24-60	5.0-15	6.6-8.4
	60-70	5.0-15	---
PsC:			
Pequea	0-8	12-17	6.1-7.3
	8-24	5.0-15	6.1-7.3
	24-60	5.0-15	6.6-8.4
	60-70	5.0-15	---
PsD:			
Pequea	0-8	12-17	6.1-7.3
	8-24	5.0-15	6.1-7.3
	24-60	5.0-15	6.6-8.4
	60-70	5.0-15	---
Pt*:			
Pits, quarries.			
RaA:			
Raritan	0-9	10-20	4.5-6.0
	9-26	10-18	4.5-6.0
	26-54	10-18	4.5-6.0
	54-60	10-18	4.5-6.0
RaB:			
Raritan	0-9	10-20	4.5-6.0
	9-26	10-18	4.5-6.0
	26-54	10-18	4.5-6.0
	54-60	10-18	4.5-6.0
ReA:			
Readington	0-10	10-15	3.6-6.5
	10-27	12-20	3.6-6.5
	27-46	12-25	5.1-6.5
	46-56	---	---
ReB:			
Readington	0-10	10-15	3.6-6.5
	10-27	12-20	3.6-6.5
	27-46	12-25	5.1-6.5
	46-56	---	---
RfB:			
Reaville	0-9	10-20	5.1-6.5
	9-15	10-20	5.1-6.5
	15-25	10-20	5.1-6.5
	25-35	---	---

See footnote at end of table.

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
RfC:			
Reaville	0-9	10-20	5.1-6.5
	9-15	10-20	5.1-6.5
	15-25	10-20	5.1-6.5
	25-35	---	---
Rw:			
Rowland	0-10	10-20	4.5-6.0
	10-28	5.0-15	4.5-6.0
	28-44	5.0-15	4.5-6.0
	44-60	5.0-10	4.5-6.0
StC:			
Steinsburg	0-10	8.0-12	3.6-5.5
	10-20	5.0-10	3.6-5.5
	20-26	5.0-10	3.6-5.5
	26-36	---	---
StD:			
Steinsburg	0-10	8.0-12	3.6-5.5
	10-20	5.0-10	3.6-5.5
	20-26	5.0-10	3.6-5.5
	26-36	---	---
Uc*:			
Urban land	0-6	---	---
UdB*:			
Urban land	0-6	---	---
Chester	0-11	5-15	4.5-5.5
	11-36	5-15	4.5-5.5
	36-60	5-15	4.5-5.5
UeB*:			
Urban land	0-6	---	---
Conestoga	0-9	8-15	4.5-7.3
	9-40	8-15	4.5-7.3
	40-60	5-15	5.6-7.8
UfC*:			
Urban land	0-6	---	---
Mt. Airy	0-8	3-10	4.5-5.5
	8-32	2-8	4.5-5.5
	32-42	2-8	---
UgB*:			
Urban land	0-6	---	---
Penn	0-9	10-20	3.6-5.5
	9-30	8.0-15	3.6-6.0
	30-38	5.0-15	5.1-6.5
	38-48	---	---

See footnote at end of table.

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
WaA:			
Watchung---------------	0-9	15-25	4.5-6.5
	9-40	10-30	5.1-7.3
	40-60	20-30	5.6-7.3
WaB:			
Watchung---------------	0-9	15-25	4.5-6.5
	9-40	10-30	5.1-7.3
	40-60	20-30	5.6-7.3
WbB:			
Watchung---------------	0-9	15-25	4.5-6.5
	9-40	10-30	5.1-7.3
	40-60	20-30	5.6-7.3

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 19.--Water Features

("Flooding" and "water table" and terms such as "frequent," very brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydro-logic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
ArB:							
Arendtsville----	B	None	---	---	>6.0	---	---
ArC:							
Arendtsville----	B	None	---	---	>6.0	---	---
ArD:							
Arendtsville----	B	None	---	---	>6.0	---	---
AtB:							
Athol-----------	B	None	---	---	>6.0	---	---
AtC:							
Athol-----------	B	None	---	---	>6.0	---	---
Ba:							
Baile-----------	D	None	---	---	0.0-0.5	Apparent	Nov-Apr
Be:							
Bermudian-------	B	Occasional	Brief	Nov-Apr	3.0-6.0	Apparent	Nov-Mar
BgA:							
Birdsboro-------	B	None	---	---	2.0-6.0	Apparent	Nov-Mar
BgB:							
Birdsboro-------	B	None	---	---	2.0-6.0	Apparent	Nov-Mar
BgC:							
Birdsboro-------	B	None	---	---	2.0-6.0	Apparent	Nov-Mar
Bo:							
Bowmansville----	B/D	Frequent	Brief	Nov-May	0.5-1.5	Apparent	Sep-May
BrB:							
Brecknock-------	B	None	---	---	>6.0	---	---
BrC:							
Brecknock-------	B	None	---	---	>6.0	---	---
BrD:							
Brecknock-------	B	None	---	---	>6.0	---	---
BsD:							
Brecknock-------	B	None	---	---	>6.0	---	---
BsF:							
Brecknock-------	B	None	---	---	>6.0	---	---
CcC:							
Catoctin--------	C	None	---	---	>6.0	---	---
Cd:							
Chagrin---------	B	Occasional	Brief	Nov-May	4.0-6.0	Apparent	Feb-Mar

See footnote at end of table.

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Water table depth	High water table: Kind of water table	High water table: Months
					Ft		
CeB:							
Chester---------	B	None	---	---	>6.0	---	---
CeC:							
Chester---------	B	None	---	---	>6.0	---	---
CkA:							
Clarksburg------	C	None	---	---	1.5-3.0	Perched	Nov-Mar
CkB:							
Clarksburg------	C	None	---	---	1.5-3.0	Perched	Nov-Mar
Cm:							
Codorous--------	C	Frequent	Very brief	Dec-Apr	1.0-2.0	Apparent	Nov-Apr
CnA:							
Conestoga-------	B	None	---	---	>6.0	---	---
CnB:							
Conestoga-------	B	None	---	---	>6.0	---	---
CnC:							
Conestoga-------	B	None	---	---	>6.0	---	---
CrA:							
Croton----------	D	None	---	---	0.0-0.5	Perched	Nov-May
CrB:							
Croton----------	D	None	---	---	0.0-0.5	Perched	Nov-May
DuA:							
Duffield--------	B	None	---	---	>6.0	---	---
DuB:							
Duffield--------	B	None	---	---	>6.0	---	---
DuC:							
Duffield--------	B	None	---	---	>6.0	---	---
DWD:							
Duffield--------	B	None	---	---	>6.0	---	---
Hagerstown------	B	None	---	---	>6.0	---	---
Dx*:							
Dumps, refuse.							
EdB:							
Edgemont--------	B	None	---	---	>6.0	---	---
EdC:							
Edgemont--------	B	None	---	---	>6.0	---	---
EdD:							
Edgemont--------	B	None	---	---	>6.0	---	---
EeB:							
Edgemont--------	B	None	---	---	>6.0	---	---

See footnote at end of table.

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Water table depth	High water table: Kind of water table	High water table: Months
					Ft		
EeD:							
Edgemont--------	B	None	---	---	>6.0	---	---
EeF:							
Edgemont--------	B	None	---	---	>6.0	---	---
EkA:							
Elk-------------	B	None	---	---	>6.0	---	---
EkB:							
Elk-------------	B	None	---	---	>6.0	---	---
GbB:							
Glenelg---------	B	None	---	---	>6.0	---	---
GbC:							
Glenelg---------	B	None	---	---	>6.0	---	---
GbD:							
Glenelg---------	B	None	---	---	>6.0	---	---
GdA:							
Glenville-------	C	None	---	---	0.5-3.0	Perched	Nov-Apr
GdB:							
Glenville-------	C	None	---	---	0.5-3.0	Perched	Nov-Apr
HaA:							
Hagerstown------	B	None	---	---	>6.0	---	---
HaB:							
Hagerstown------	B	None	---	---	>6.0	---	---
HaC:							
Hagerstown------	B	None	---	---	>6.0	---	---
Hc:							
Hatboro---------	D	Frequent	Very brief	Nov-May	0.0-0.5	Apparent	Oct-May
HgB:							
Highfield-------	B	None	---	---	>6.0	---	---
HgC:							
Highfield-------	B	None	---	---	>6.0	---	---
HHD:							
Highfield-------	B	None	---	---	>6.0	---	---
Catoctin--------	C	None	---	---	>6.0	---	---
HKD:							
Highfield-------	B	None	---	---	>6.0	---	---
Catoctin--------	C	None	---	---	>6.0	---	---
Myersville------	B	None	---	---	>6.0	---	---
KnD:							
Klinesville-----	C	None	---	---	>6.0	---	---

See footnote at end of table.

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
KnE:							
Klinesville-----	C	None	---	---	>6.0	---	---
Lc:							
Lamington-------	D	None	---	---	0.0-0.5	Apparent	Nov-Mar
LeB:							
Lansdale--------	B	None	---	---	>6.0	---	---
LfC:							
Lansdale--------	B	None	---	---	>6.0	---	---
LgB:							
Legore----------	B	None	---	---	>6.0	---	---
LgC:							
Legore----------	B	None	---	---	>6.0	---	---
LgD:							
Legore----------	B	None	---	---	>6.0	---	---
LhA:							
Lehigh----------	C	None	---	---	0.5-3.0	Perched	Nov-Mar
LhB:							
Lehigh----------	C	None	---	---	0.5-3.0	Perched	Nov-Mar
LhC:							
Lehigh----------	C	None	---	---	0.5-3.0	Perched	Nov-Mar
LhD:							
Lehigh----------	C	None	---	---	0.5-3.0	Perched	Nov-Mar
LkB:							
Lehigh----------	C	None	---	---	0.5-3.0	Perched	Nov-Mar
LrB:							
Lewisberry------	B	None	---	---	>6.0	---	---
LrC:							
Lewisberry------	B	None	---	---	>6.0	---	---
LSD:							
Lewisberry------	B	None	---	---	>6.0	---	---
Lansdale--------	B	None	---	---	>6.0	---	---
Lw:							
Lindside--------	C	Frequent	Brief	Dec-Apr	1.5-3.0	Apparent	Dec-Apr
MdA:							
Mount Lucas-----	C	None	---	---	0.5-3.0	Perched	Nov-Mar
MdB:							
Mount Lucas-----	C	None	---	---	0.5-3.0	Perched	Nov-Mar
MeB:							
Mount Lucas-----	C	None	---	---	0.5-3.0	Perched	Nov-Mar

See footnote at end of table.

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Water table depth	High water table: Kind of water table	High water table: Months
					Ft		
MOB:							
Mt. Airy	A	None	---	---	>6.0	---	---
Manor	B	None	---	---	>6.0	---	---
MOC:							
Mt. Airy	A	None	---	---	>6.0	---	---
Manor	B	None	---	---	>6.0	---	---
MOD:							
Mt. Airy	A	None	---	---	>6.0	---	---
Manor	B	None	---	---	>6.0	---	---
MOE:							
Mt. Airy	A	None	---	---	>6.0	---	---
Manor	B	None	---	---	>6.0	---	---
MPD:							
Mt. Airy	A	None	---	---	>6.0	---	---
Manor	B	None	---	---	>6.0	---	---
MRF:							
Mt. Airy	A	None	---	---	>6.0	---	---
Manor	B	None	---	---	>6.0	---	---
MvB:							
Murrill	B	None	---	---	>6.0	---	---
MvC:							
Murrill	B	None	---	---	>6.0	---	---
NaB:							
Neshaminy	B	None	---	---	>6.0	---	---
NaC:							
Neshaminy	B	None	---	---	>6.0	---	---
NdB:							
Neshaminy	B	None	---	---	>6.0	---	---
NdD:							
Neshaminy	B	None	---	---	>6.0	---	---
NdE:							
Neshaminy	B	None	---	---	>6.0	---	---
Pa:							
Penlaw	C	None	---	---	0.5-1.5	Perched	Nov-Mar
PbB:							
Penn	C	None	---	---	>6.0	---	---
PbD:							
Penn	C	None	---	---	>6.0	---	---

See footnote at end of table.

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
PcF:							
Penn	C	None	---	---	>6.0	---	---
PeB:							
Penn	C	None	---	---	>6.0	---	---
PeC:							
Penn	C	None	---	---	>6.0	---	---
PoB:							
Penn	C	None	---	---	>6.0	---	---
Klinesville	C	None	---	---	>6.0	---	---
PoC:							
Penn	C	None	---	---	>6.0	---	---
Klinesville	C	None	---	---	>6.0	---	---
PpB:							
Penn	C	None	---	---	>6.0	---	---
Lansdale	B	None	---	---	>6.0	---	---
PpC:							
Penn	C	None	---	---	>6.0	---	---
Lansdale	B	None	---	---	>6.0	---	---
PsB:							
Pequea	B	None	---	---	>6.0	---	---
PsC:							
Pequea	B	None	---	---	>6.0	---	---
PsD:							
Pequea	B	None	---	---	>6.0	---	---
Pt*:							
Pits, quarries.							
RaA:							
Raritan	C	None	---	---	0.5-3.0	Perched	Nov-Mar
RaB:							
Raritan	C	None	---	---	0.5-3.0	Perched	Nov-Mar
ReA:							
Readington	C	None	---	---	1.5-3.0	Perched	Nov-Mar
ReB:							
Readington	C	None	---	---	1.5-3.0	Perched	Nov-Mar
RfB:							
Reaville	C	None	---	---	0.5-3.0	Apparent	Nov-Mar
RfC:							
Reaville	C	None	---	---	0.5-3.0	Apparent	Nov-Mar

See footnote at end of table.

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Water table depth	High water table: Kind of water table	High water table: Months
					Ft		
Rw:							
Rowland----------	C	Frequent	Brief	Nov-Mar	1.0-3.0	Apparent	Nov-May
StC:							
Steinsburg------	B	None	---	---	>6.0	---	---
StD:							
Steinsburg------	B	None	---	---	>6.0	---	---
Uc*:							
Urban land------		None	---	---	>2.0	---	---
UdB*:							
Urban land------		None	---	---	>2.0	---	---
Chester---------	B	None	---	---	>6.0	---	---
UeB*:							
Urban land------		None	---	---	>2.0	---	---
Conestoga-------	B	None	---	---	>6.0	---	---
UfC*:							
Urban land------		None	---	---	>2.0	---	---
Mt. Airy--------	A	None	---	---	>6.0	---	---
UgB*:							
Urban land------		None	---	---	>2.0	---	---
Penn------------	C	None	---	---	>6.0	---	---
WaA:							
Watchung--------	D	None	---	---	0.0-1.0	Apparent	Dec-Jun
WaB:							
Watchung--------	D	None	---	---	0.0-1.0	Apparent	Dec-Jun
WbB:							
Watchung--------	D	None	---	---	0.0-1.0	Apparent	Dec-Jun

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 20.--Soil Features

(The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that the data were not estimated)

Map symbol and soil name	Bedrock		Potential frost action	Risk of corrosion	
	Depth	Hardness		Uncoated steel	Concrete
	In				
ArB:					
Arendtsville----	60-99	---	Moderate	Low	High.
ArC:					
Arendtsville----	60-99	---	Moderate	Low	High.
ArD:					
Arendtsville----	60-99	---	Moderate	Low	High.
AtB:					
Athol-----------	60-99	Hard	Moderate	Low	High.
AtC:					
Athol-----------	60-99	Hard	Moderate	Low	High.
Ba:					
Baile-----------	>60	---	High	High	High.
Be:					
Bermudian-------	>60	---	Moderate	Low	Moderate.
BgA:					
Birdsboro-------	>60	---	Moderate	Moderate	High.
BgB:					
Birdsboro-------	>60	---	Moderate	Moderate	High.
BgC:					
Birdsboro-------	>60	---	Moderate	Moderate	High.
Bo:					
Bowmansville----	72-99	---	High	High	Moderate.
BrB:					
Brecknock-------	40-60	Hard	Moderate	Low	Moderate.
BrC:					
Brecknock-------	40-60	Hard	Moderate	Low	Moderate.
BrD:					
Brecknock-------	40-60	Hard	Moderate	Low	Moderate.
BsD:					
Brecknock-------	40-60	Hard	Moderate	Low	Moderate.
BsF:					
Brecknock-------	40-60	Hard	Moderate	Low	Moderate.
CcC:					
Catoctin--------	20-40	Hard	Low	High	Moderate.
Cd:					
Chagrin---------	>60	---	Moderate	Low	Moderate.
CeB:					
Chester---------	>60	---	Moderate	Low	High.

See footnote at end of table.

Table 20.--Soil Features--Continued

Map symbol and soil name	Bedrock		Potential frost action	Risk of corrosion	
	Depth	Hardness		Uncoated steel	Concrete
	In				
CeC:					
Chester	>60	---	Moderate	Low	High.
CkA:					
Clarksburg	60-99	---	Moderate	Moderate	Moderate.
CkB:					
Clarksburg	60-99	---	Moderate	Moderate	Moderate.
Cm:					
Codorous	>60	---	High	High	Moderate.
CnA:					
Conestoga	>60	---	Moderate	Moderate	High.
CnB:					
Conestoga	>60	---	Moderate	Moderate	High.
CnC:					
Conestoga	>60	---	Moderate	Moderate	High.
CrA:					
Croton	42-60	Hard	High	High	High.
CrB:					
Croton	42-60	Hard	High	High	High.
DuA:					
Duffield	60-99	Hard	Moderate	Moderate	Moderate.
DuB:					
Duffield	60-99	Hard	Moderate	Moderate	Moderate.
DuC:					
Duffield	60-99	Hard	Moderate	Moderate	Moderate.
DWD:					
Duffield	60-99	Hard	Moderate	Moderate	Moderate.
Hagerstown	60-80	Hard	Moderate	Moderate	Low.
Dx*:					
Dumps, refuse.					
EdB:					
Edgemont	40-84	Hard	Moderate	Low	High.
EdC:					
Edgemont	40-84	Hard	Moderate	Low	High.
EdD:					
Edgemont	40-84	Hard	Moderate	Low	High.
EeB:					
Edgemont	40-84	Hard	Moderate	Low	High.
EeD:					
Edgemont	40-84	Hard	Moderate	Low	High.

See footnote at end of table.

Table 20.--Soil Features--Continued

Map symbol and soil name	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
	In				
EeF:					
Edgemont--------	40-84	Hard	Moderate	Low	High.
EkA:					
Elk-------------	>60	---	None	Moderate	Moderate.
EkB:					
Elk-------------	>60	---	None	Moderate	Moderate.
GbB:					
Glenelg---------	40-60	Soft	Moderate	Low	High.
GbC:					
Glenelg---------	40-60	Soft	Moderate	Low	High.
GbD:					
Glenelg---------	40-60	Soft	Moderate	Low	High.
GdA:					
Glenville-------	60-99	---	High	High	Moderate.
GdB:					
Glenville-------	60-99	---	High	High	Moderate.
HaA:					
Hagerstown------	60-80	Hard	Moderate	Moderate	Low.
HaB:					
Hagerstown------	60-80	Hard	Moderate	Moderate	Low.
HaC:					
Hagerstown------	60-80	Hard	Moderate	Moderate	Low.
Hc:					
Hatboro---------	>60	---	High	High	Moderate.
HgB:					
Highfield-------	>40	Soft	Moderate	Low	Moderate.
HgC:					
Highfield-------	>40	Soft	Moderate	Low	Moderate.
HHD:					
Highfield-------	>40	Soft	Moderate	Low	Moderate.
Catoctin--------	20-40	Hard	Low	High	Moderate.
HKD:					
Highfield-------	>40	Hard	Moderate	Low	Moderate.
Catoctin--------	20-40	Hard	Low	High	Moderate.
Myersville------	40-60	Soft	Moderate	Moderate	Moderate.
KnD:					
Klinesville-----	10-20	Soft	Moderate	Moderate	High.
KnE:					
Klinesville-----	10-20	Soft	Moderate	Moderate	High.

See footnote at end of table.

Table 20.--Soil Features--Continued

Map symbol and soil name	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
	In				
Lc:					
Lamington	>60	---	High	High	Moderate.
LeB:					
Lansdale	42-60	Soft	Moderate	Low	High.
LfC:					
Lansdale	42-60	Soft	Moderate	Low	High.
LgB:					
Legore	>60	---	Moderate	Moderate	Moderate.
LgC:					
Legore	>60	---	Moderate	Moderate	Moderate.
LgD:					
Legore	>60	---	Moderate	Moderate	Moderate.
LhA:					
Lehigh	40-60	Hard	High	Moderate	Moderate.
LhB:					
Lehigh	40-60	Hard	High	Moderate	Moderate.
LhC:					
Lehigh	40-60	Hard	High	Moderate	Moderate.
LhD:					
Lehigh	40-60	Hard	High	Moderate	Moderate.
LkB:					
Lehigh	40-60	Hard	High	Moderate	Moderate.
LrB:					
Lewisberry	48-84	Hard	Moderate	Low	High.
LrC:					
Lewisberry	48-84	Hard	Moderate	Low	High.
LSD:					
Lewisberry	48-84	Hard	Moderate	Low	High.
Lansdale	40-60	Soft	Moderate	Low	High.
Lw:					
Lindside	>60	---	High	Moderate	Low.
MdA:					
Mount Lucas	48-99	Hard	High	High	Moderate.
MdB:					
Mount Lucas	48-99	Hard	High	High	Moderate.
MeB:					
Mount Lucas	48-99	Hard	High	High	Moderate.
MOB:					
Mt. Airy	20-40	Soft	Moderate	Low	High.
Manor	>60	---	Moderate	Low	Moderate.

See footnote at end of table.

Table 20.--Soil Features--Continued

Map symbol and soil name	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
	In				
MOC:					
Mt. Airy--------	20-40	Soft	Moderate	Low	High.
Manor-----------	>60	---	Moderate	Low	Moderate.
MOD:					
Mt. Airy--------	20-40	Soft	Moderate	Low	High.
Manor-----------	>60	---	Moderate	Low	Moderate.
MOE:					
Mt. Airy--------	20-40	Soft	Moderate	Low	High.
Manor-----------	>60	---	Moderate	Low	Moderate.
MPD:					
Mt. Airy--------	20-40	Soft	Moderate	Low	High.
Manor-----------	>60	---	Moderate	Low	Moderate.
MRF:					
Mt. Airy--------	20-40	Soft	Moderate	Low	High.
Manor-----------	>60	---	Moderate	Low	Moderate.
MvB:					
Murrill---------	>60	---	Moderate	Moderate	High.
MvC:					
Murrill---------	>60	---	Moderate	Moderate	High.
NaB:					
Neshaminy-------	48-99	Hard	Moderate	Moderate	Moderate.
NaC:					
Neshaminy-------	48-99	Hard	Moderate	Moderate	Moderate.
NdB:					
Neshaminy-------	>48	Hard	Moderate	Moderate	Moderate.
NdD:					
Neshaminy-------	>48	Hard	Moderate	Moderate	Moderate.
NdE:					
Neshaminy-------	>48	Hard	Moderate	Moderate	Moderate.
Pa:					
Penlaw----------	40-72	Hard	High	High	Moderate.
PbB:					
Penn------------	20-40	Soft	Moderate	Low	Moderate.
PbD:					
Penn------------	20-40	Soft	Moderate	Low	Moderate.
PcF:					
Penn------------	20-40	Soft	Moderate	Low	Moderate.
PeB:					
Penn------------	20-40	Soft	Moderate	Low	Moderate.

See footnote at end of table.

Table 20.--Soil Features--Continued

Map symbol and soil name	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
	In				
PeC:					
Penn-----------	20-40	Soft	Moderate	Low	Moderate.
PoB:					
Penn-----------	20-40	Soft	Moderate	Low	Moderate.
Klinesville-----	10-20	Soft	Moderate	Moderate	High.
PoC:					
Penn-----------	20-40	Soft	Moderate	Low	Moderate.
Klinesville-----	10-20	Soft	Moderate	Moderate	High.
PpB:					
Penn-----------	20-40	Soft	Moderate	Low	Moderate.
Lansdale--------	42-60	Soft	Moderate	Low	High.
PpC:					
Penn-----------	20-40	Soft	Moderate	Low	Moderate.
Lansdale--------	42-60	Soft	Moderate	Low	High.
PsB:					
Pequea----------	40-60	Hard	Moderate	Low	Low.
PsC:					
Pequea----------	40-60	Hard	Moderate	Low	Low.
PsD:					
Pequea----------	40-60	Hard	Moderate	Low	Low.
Pt*:					
Pits, quarries.					
RaA:					
Raritan---------	>60	---	High	High	Moderate.
RaB:					
Raritan---------	>60	---	High	High	Moderate.
ReA:					
Readington------	>40	Soft	Moderate	Moderate	Moderate.
ReB:					
Readington------	>40	Soft	Moderate	Moderate	Moderate.
RfB:					
Reaville--------	20-40	Soft	High	High	Moderate.
RfC:					
Reaville--------	20-40	Soft	High	High	Moderate.
Rw:					
Rowland---------	>72	---	High	High	Moderate.
StC:					
Steinsburg------	24-40	Soft	None	Low	High.

See footnote at end of table.

Table 20.--Soil Features--Continued

Map symbol and soil name	Bedrock		Potential frost action	Risk of corrosion	
	Depth	Hardness		Uncoated steel	Concrete
	In				
StD:					
Steinsburg------	24-40	Soft	None	Low	High.
Uc*:					
Urban land------	>10	---	None	---	---
UdB*:					
Urban land------	>10	---	None	---	---
Chester---------	>60	---	Moderate	Low	High.
UeB*:					
Urban land------	>10	---	None	---	---
Conestoga-------	>60	---	Moderate	Moderate	High.
UfC*:					
Urban land------	>10	---	None	---	---
Mt. Airy--------	20-40	Soft	Moderate	Low	High.
UgB*:					
Urban land------	>10	---	None	---	---
Penn------------	20-40	Soft	Moderate	Low	Moderate.
WaA:					
Watchung--------	>60	---	High	High	Moderate.
WaB:					
Watchung--------	>60	---	High	High	Moderate.
WbB:					
Watchung--------	>60	---	High	High	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 21.--Classification of the Soils

(An asterisk in the first column indicates that the soils are a taxadjunct to the series. See "Classification of the Soils" for a description of those characteristics that are outside the range of the series)

Soil name	Family or higher taxonomic class
Arendtsville	Fine-loamy, mixed, mesic Typic Hapludults
Athol	Fine-loamy, mixed, mesic Ultic Hapludalfs
Baile	Fine-loamy, mixed, mesic Typic Ochraquults
Bermudian	Fine-loamy, mixed, mesic Fluventic Dystrochrepts
Birdsboro	Fine-loamy, mixed, mesic Typic Hapludults
Bowmansville	Fine-loamy, mixed, nonacid, mesic Aeric Fluvaquents
Brecknock	Fine-loamy, mixed, mesic Ultic Hapludalfs
Catoctin	Loamy-skeletal, mixed, mesic Ruptic-Alfic Eutrochrepts
Chagrin	Fine-loamy, mixed, mesic Dystric Fluventic Eutrochrepts
Chester	Fine-loamy, mixed, mesic Typic Hapludults
Clarksburg	Fine-loamy, mixed, mesic Typic Fragiudalfs
Codorus	Fine-loamy, mixed, mesic Fluvaquentic Dystrochrepts
Conestoga	Fine-loamy, mixed, mesic Typic Hapludalfs
Croton	Fine-silty, mixed, mesic Typic Fragiaqualfs
Duffield	Fine-loamy, mixed, mesic Ultic Hapludalfs
Edgemont	Fine-loamy, mixed, mesic Typic Hapludults
Elk	Fine-silty, mixed, mesic Ultic Hapludalfs
Glenelg	Fine-loamy, mixed, mesic Typic Hapludults
Glenville	Fine-loamy, mixed, mesic Aquic Fragiudults
Hagerstown	Fine, mixed, mesic Typic Hapludalfs
Hatboro	Fine-loamy, mixed, nonacid, mesic Typic Fluvaquents
*Highfield	Coarse-loamy, mixed, mesic Ultic Hapludalfs
Klinesville	Loamy-skeletal, mixed, mesic Lithic Dystrochrepts
Lamington	Fine-loamy, mixed, mesic Typic Fragiaquults
Lansdale	Coarse-loamy, mixed, mesic Typic Hapludults
Legore	Fine-loamy, mixed, mesic Ultic Hapludalfs
Lehigh	Fine-loamy, mixed, mesic Aquic Hapludalfs
Lewisberry	Coarse-loamy, mixed, mesic Ultic Hapludalfs
Lindside	Fine-silty, mixed, mesic Fluvaquentic Eutrochrepts
Manor	Coarse-loamy, micaceous, mesic Typic Dystrochrepts
Mount Lucas	Fine-loamy, mixed, mesic Aquic Hapludalfs
Mt. Airy	Loamy-skeletal, micaceous, mesic Typic Dystrochrepts
Murrill	Fine-loamy, mixed, mesic Typic Hapludults
Myersville	Fine-loamy, mixed, mesic Ultic Hapludalfs
Neshaminy	Fine-loamy, mixed, mesic Ultic Hapludalfs
Penlaw	Fine-silty, mixed, mesic Aquic Fragiudalfs
Penn	Fine-loamy, mixed, mesic Ultic Hapludalfs
Pequea	Coarse-loamy, mixed, mesic Typic Eutrochrepts
Raritan	Fine-loamy, mixed, mesic Aquic Fragiudults
Readington	Fine-loamy, mixed, mesic Typic Fragiudalfs
Reaville	Fine-loamy, mixed, mesic Aquic Hapludalfs
Rowland	Fine-loamy, mixed, mesic Fluvaquentic Dystrochrepts
*Steinsburg	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Watchung	Fine, mixed, mesic Typic Ochraqualfs

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